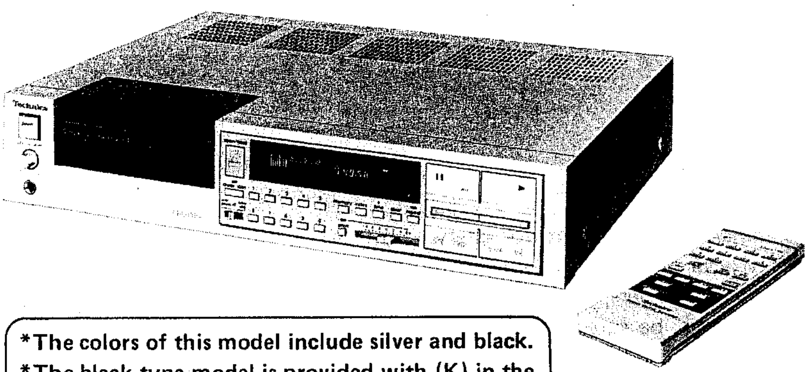
555 ORDER NO. DPD83100033C9

Service Manual

DIGITAL

Compact Disc Player
SL-P8/(K)
[E], [EK], [XL], [EG], [EB], [EH], [EF], [Ei], [XA], [PA], [PE], [PC]



*The colors of this model include silver and black.
*The black type model is provided with (K) in the Service Manual.

Areas

*[E]	is available in Switzerland and Scandinavia.
*[EK]	is available in United Kingdom.
*[XL]	is available in Australia.
*[EG]	is available in F.R Germany.
*[EB]	is available in Belgium.
*[EH]	is available in Holland.
*[EF]	is available in France.
*[Ei]	is available in Italy.
*[XA]	is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
*[PA]	is available in far East PX.
*[PE]	is available in European Military.
*[PC]	is available in European Audio Club.

Specifications

Specifications are subject to change without notice for further improvement.
Weight and dimensions shown are approximate.

■ Audio

No. of channels:	2 (left and right stereo)
Frequency response:	4 ~ 20,000 Hz ± 0.5 dB
Dynamic range:	more than 96 dB
S/N ratio:	more than 96 dB
Total harm. distortion:	less than 0.003% (1 kHz, 0 dB)
Channel separation:	more than 90 dB
Wow and flutter:	below measurable limit

■ Signal Format

Sampling frequency:	44.1 kHz
Correction system:	Technics Super Decoding Algorithm
D-A conversion:	16-bit linear

■ Pickup

Type:	Astigma 3-beam
Light source:	Semiconductor laser
Wavelength:	800 nm

■ Functions

Search modes:	Manual search, Index search, Track skip, Index skip, Music scan
Program functions:	Max. of 32 steps Location of beginning of tracks, Selection of starting and ending positions (by track no., index no. or time)
Display functions:	Digital display—No. of tracks, Total playing time (min., sec.), Track being played, Elapsed playing time, Index no., Remaining playing time Segment display—No., of tracks, Track being played, Programmed tracks
Operation buttons:	Basic buttons—7 Program buttons—14 Music scan button—1 Repeat button—1 Pitch control slider—1
Disc loading:	Motor-driven horizontal type
Headphone output level:	Max. 200mW (adjustable), 32Ω

■ General

Power supply:	~110–120/220–240V, 50/60Hz
Power consumption:	35 watts
Output voltage:	2 volts (at 0 dB)
Output impedance:	330Ω
Load impedance:	more than 5kΩ
Dimensions: (W x D x H)	43 x 32.5 x 8.8 cm (16 15/16" x 12 13/16" x 3 15/32") (When disc holder is opened 43 x 45.1 x 8.8 cm (16 15/16" x 17 3/4" x 3 15/32"))
Weight:	6.1 kg (13.4 lbs)

■ Infrared Remote Control Unit

Remote control functions:	Basic buttons—6 Program buttons—14 Music scan button—1 Repeat button—1
Dimensions: (W x H x D)	6.4 x 15.5 x 1.4 cm
Weight:	100 grams (with batteries)
Batteries:	UM–4 "AAA" batteries or IEC R03 or equivalent (1.5Vx2)

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Tokyo
Matsushita Electric Industrial Co., Ltd.
1-2, 1-chome, Shibakoen, Minato-ku, Tokyo 105 Japan

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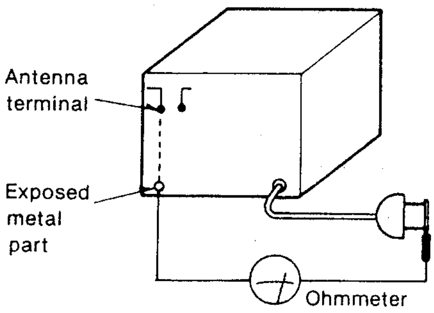
■ SAFETY PRECAUTION

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

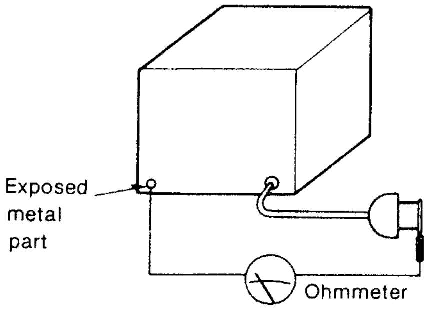
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

Caution : This product utilizes a laser diode.
ADVARSEL : I dette apparat anvendes laser.

CLASS 1
LASER PRODUCT
SRNZ010S01

ADVARSEL-Usynligt laserlys udstråles ved åbning.
Undgå direkte bestråling.

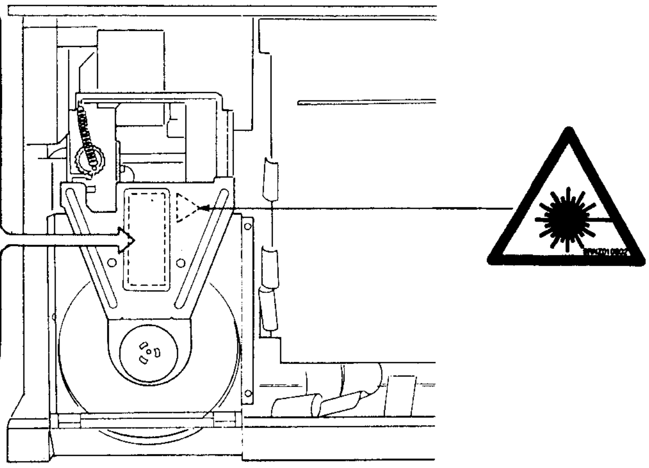
DANGER-Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.
SRNZ007S02

"CAUTION-HAZARDOUS LASER, AND ELECTROMAGNETIC RADIATION WHEN OPEN"
"ATTENTION-RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT"
SRNZ007C01

- Use of caution labels

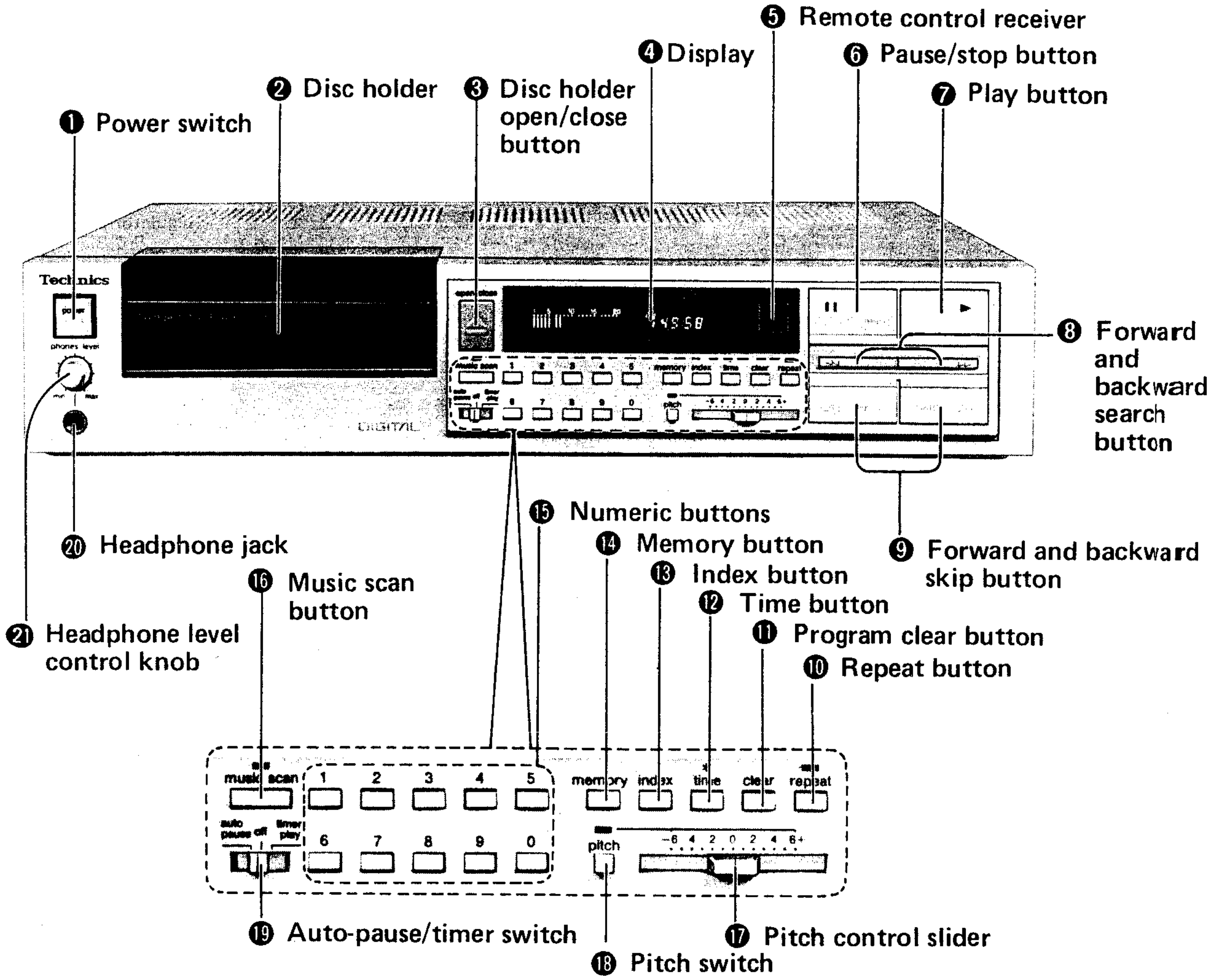
	U.S.A.	Canada	Europe	Others
SRNZ010S01	X	X	○	○
SRNZ007S02	○	X	○	○
SRNZ007C01	X	○	X	X
SRNZ010S02	X	X	○	○

Note: ○ Mark Label is used. X Mark Label is not used.


SRNZ010S02

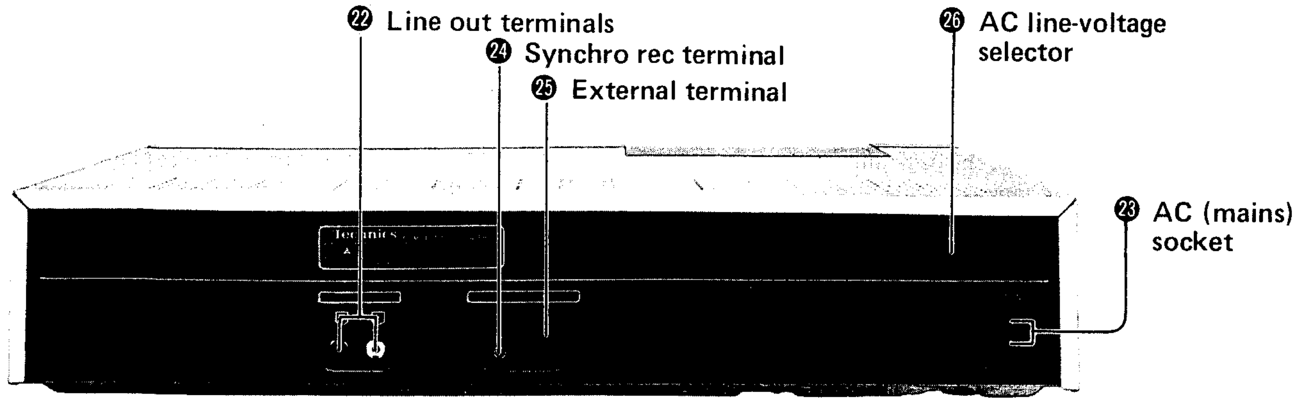
■ LOCATION OF CONTROLS

- Front panel view



❶ Power switch
❷ Disc holder
❸ Disc holder open/close button
❹ Display
❺ Remote control receiver
❻ Pause/stop button
❼ Play button
❽ Forward and backward search button
❾ Forward and backward skip button
❿ Repeat button
⓫ Program clear button
⓬ Time button
⓭ Index button
⓮ Memory button
⓯ Numeric buttons
⓰ Music scan button
⓱ Pitch control slider
⓲ Pitch switch
⓳ Auto-pause/timer switch
⓴ Headphone jack
(21) Headphone level control knob
Technics
power
phones level
DIGITAL
music scan
1
2
3
4
5
6
7
8
9
0
memory
index
time
clear
repeat
auto pause
off
timer play
pitch
−6 4 2 0 2 4 6+

- Rear panel view



Functions

❶ Power switch

- Press once to turn power on and again to turn power off.
- When power is turned on, the display will read (0) for the track number and (0.00) for the time.
- When the auto-pause/timer switch is set to auto pause, the indicator in the play button (▶) will light for only about 5 seconds if no disc is inserted.

❷ Disc holder

- The disc is inserted in this holder with label side up.

❸ Disc holder open/close button

- Press this button to insert or remove a disc. When this button is pressed, the disc holder opens.
- Press this button again to close the holder.

❹ Display Section

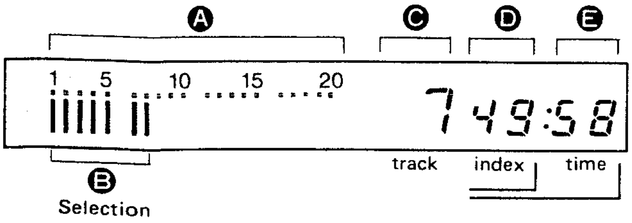
Ⓐ Segment display scale
Shows the track number of each segment from 1 to 20.

Ⓑ Track number segment display
  - Displays up to 20 tracks. For track numbers higher than 20, the overrun indicator (▶) to the right of this display lights.
  - The segment of the track currently being played flashes on and off.
  - Once a track has been played, its segment goes out.
  - Programmed tracks are also shown by the segment display.

Ⓒ Digital track number display

Ⓓ Elapsed/remaining playing time display (minutes)
  - The index number is displayed here when the index button is pressed.

Ⓔ Elapsed/remaining playing time display (seconds)



The information displayed differs according to the present operating mode. Refer to the Playing a disc section for details.

- The unit switches to the standby mode when a disc is inserted in the holder. In the standby mode, the pickup is located at the beginning of the first track and the display is showing the total number of tracks on the disc and the total playing time.
- The display shown above is for a disc containing a total of 7 tracks having a total playing time of 49 minutes and 58 seconds. However, if the play button is pressed while the disc holder is still open, the holder will close and the disc will be played from the beginning without the track numbers or playing time being displayed.

Note:
The pickup uses a laser to read the information on the disc surface. The pickup is not visible from the outside of the player.

❺ Remote control receiver

- The infrared signal from the remote control unit included with this player is received here.
- Before pressing one of the remote control unit buttons, the unit should be aimed at this receiver. The remote control indicator will light while the button is held down to confirm that a command is being received.

❻ Pause/stop button

- This button activates both the pause and stop (standby) modes.
- When this button is pressed while a disc is being played, the **II** indicator lights to show that the pause mode has been activated. Press the play button to cancel the pause mode and resume disc play.
- If the pause/stop button is held down for more than about one second, the stop (standby) mode is activated (the **II** indicator goes out) and the pickup returns to the beginning of the first track on the disc.
- The disc continues to rotate for about 20 seconds after the stop mode is activated so that the palyer can quickly switch to the paly or skip function if one of those buttons is pressed. If these buttons are not pressed during the 20 second period, the disc will stop rotating.

⑦ Play button

- Press this button to begin disc play. The play indicator (▶) lights up to show when this button has been pressed.
- When this button is pressed during disc play, the pickup returns to the starting position and disc play starts again from the beginning. During program disc play, disc play starts again from the beginning of the program.
- When this button is pressed while the pause mode is activated, pause is cancelled and the player returns to the play mode.

⑧ Forward and backward search buttons

- Use these buttons to move the pickup forward and backward. The buttons are used in the following manner.

1. Use the search buttons when the player is in the pause mode or during disc play to move the pickup to a specific point on the disc.
2. Use the digital track number display and playing time display to locate the desired point on the disc.
    - During disc play, search can be performed while listening to the signal from the disc to aid in locating a specific point. The output level is −12 dB compared with the level during standard disc play.
    - Press the ►► button to move the pickup forward.
    - Press the ◄◄ button to move the pickup backward.

- When either of these buttons is pressed, the pickup will move slowly at first and then rapidly if the button is held down for more than about three seconds.

⑨ Forward and backward skip buttons

1. During the pause mode or disc play, press one of the skip buttons to perform forward or backward skip operation.
2. During program disc play, the pickup either moves ahead to the beginning of the next programmed track or back to the beginning of the previous programmed track.
    - Press the skip ▷| button to move the pickup forward.
    - Press the |◁ skip button to move the pickup backward.
    - When either of these buttons is held down, tracks are skipped continuously. (Quick skip)

⑩ Repeat button

- Press this button to activate the repeat play mode. The repeat indicator lights to show when the repeat mode is activated.
- If the repeat mode is activated during program disc play, the program will be played repeatedly.
- Press this button again to cancel the repeat mode (repeat indicator goes out).

⑪ Program clear button

- Press this button to erase the program in the memory. This button is also used to cancel the index and remaining playing time display modes.

⑫ Time button

The time button is used for the following functions:

1. To start disc play after a track number or time has been input using the numeric buttons.
2. To start disc play after a track number or time has been programmed.
3. To switch the display to the remaining playing time mode. (not possible during program disc play)
4. To return the display from the remaining playing time mode to the elapsed time mode.
5. To return the index number display (activated by pressing the index button) to the elapsed playing time mode.
6. To display the number of tracks on a disc and the playing time of each track one by one when the player is in the standby mode.

⑬ Index button

The index button is used for the following functions:

1. When an index number is specified for direct access disc play.
2. To start disc play at a specific index number.
3. To display the index number currently being played.
4. To switch the display from the remaining playing time mode to the index number mode.
5. To perform index skip operation.

⑭ Memory button

- Press to store a track number, index number or playing time in the memory for program disc play.
- Up to 32 steps can be programmed in any order.

⑮ Numeric buttons

The numeric buttons are used for the following functions:

1. To specify track and index numbers.
2. To specify playing times in minutes and seconds.

⑯ Music scan button

- When this button is pressed, the music scan indicator lights and the first 10 seconds of each track on the disc or each track in the program is played. Once scanning has ended, the indicator goes out and the disc is played from the beginning or from the first programmed track if the player is in the program disc play mode.
- Press the play button during one of the 10 second disc play periods to cancel music scan and begin disc play from that point (indicator goes out).
- Music scan can also be cancelled by pressing the pause/stop button.

⑰ Pitch control slider

- Use this slider to adjust the speed at which the disc rotates. This control can only be used after the pitch switch has been pressed to light the pitch indicator.
- Pitch is displayed by an approximate percentage. Pitch is adjustable ±6%.
- Press the pitch switch again to return to standard disc play.

⑱ Pitch switch

- Press to activate the pitch control function (pitch indicator lights). Press again to return to standard disc play (indicator goes out).

⑲ Auto-pause/timer switch

- When this switch is set to auto-pause, the player switches to the pause mode at the end of each track during standard disc play and program disc play.
- Press the play button to continue disc play. This function is very useful when singing along with discs.
- Set this switch to timer to use the player for timer play.
- Set to the center off position to cancel the auto-pause or timer mode.
- The auto-pause function will not operate on discs that do not contain a pause signal in each between-tracks gap.

⑳ Headphone jack

㉑ Headphone level control knob

- Use to control the output level to the headphones.

㉒ Line out terminals (LINE OUT)

- These are the audio output terminals.
- Connect the line out terminals to the AUX/CD/VIDEO or TAPE PLAYBACK terminals on your amplifier or receiver.
- Do not connect to the amplifier PHONO terminals as you would with a conventional turntable.

㉓ AC (mains) socket (AC IN)

Connect this socket to a wall socket using the power cord.

㉔ Synchro rec terminal

The following functions are possible when this terminal is used:

Synchro recording function

Recording can be synchronized with the beginning and end of disc play and pause operation. Note that this is only possible when using Technics cassette decks which are equipped with a CD-SYNCHRO REC terminal and Technics amplifiers which are equipped with a synchro rec terminal compatible with Compact Disc players.
Use the MINI-PHONE cord (option) for the synchro rec connection. (SJP2257)

Direct operation function

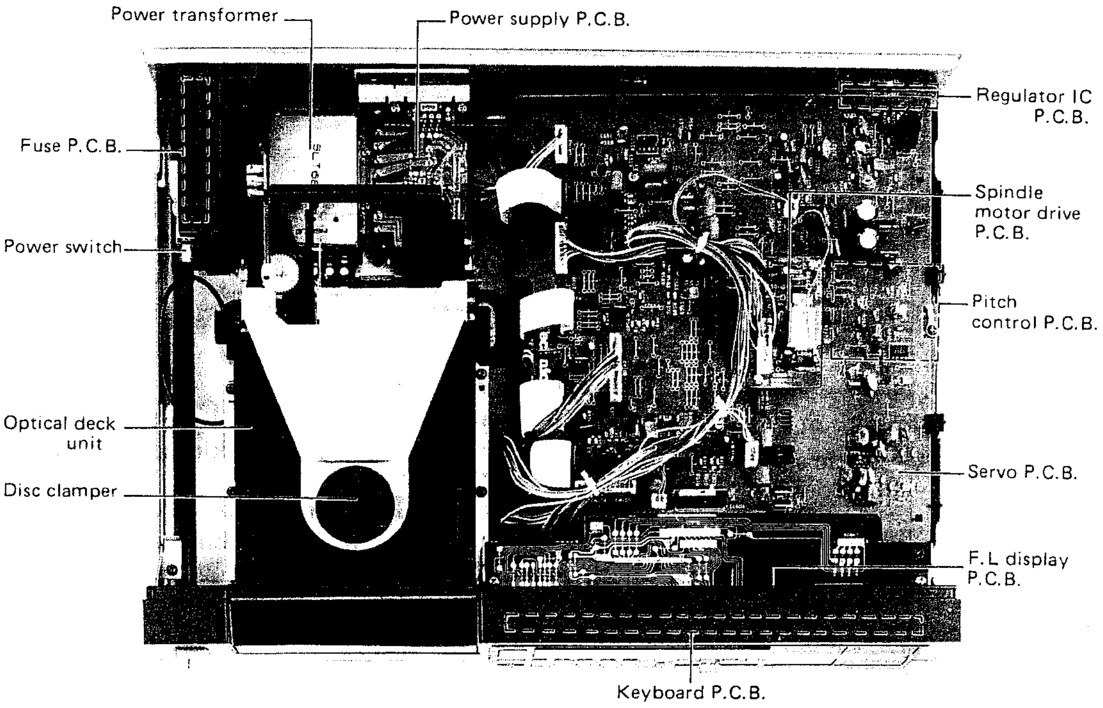
The amplifier input source can be automatically switched to aux/CD/video when the play button is pressed. It is also possible to automatically start disc play when the amplifier input source selector is switched to aux/CD/video.
Note that this is only possible when using Technics amplifiers which have a direct operation function.

㉕ External terminal

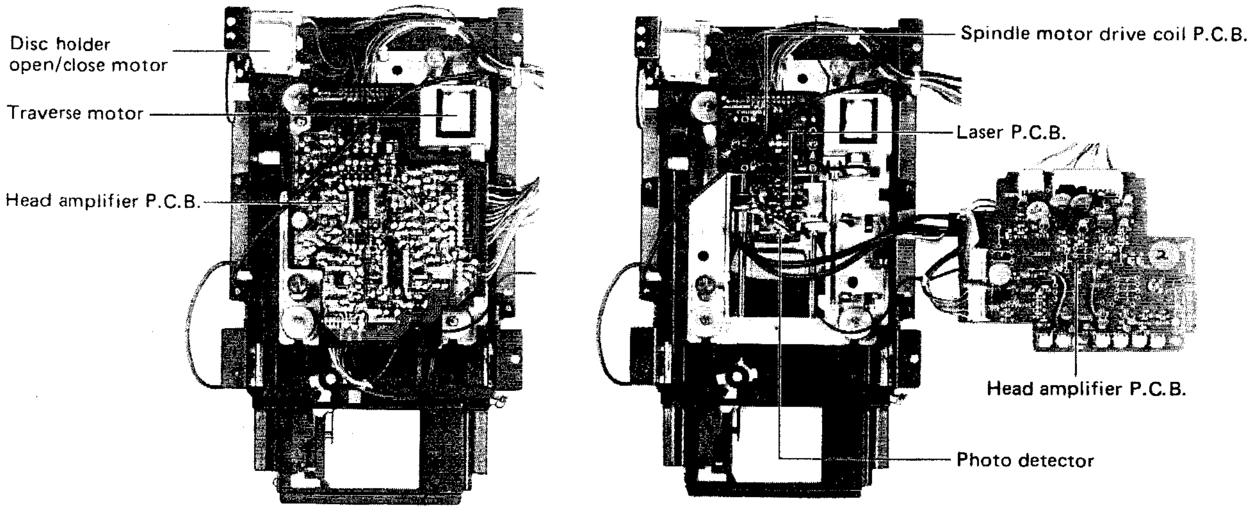
- This terminal is provided for system connections with future components.
- Do not connect any other components to this terminal.

㉖ AC line-voltage selector

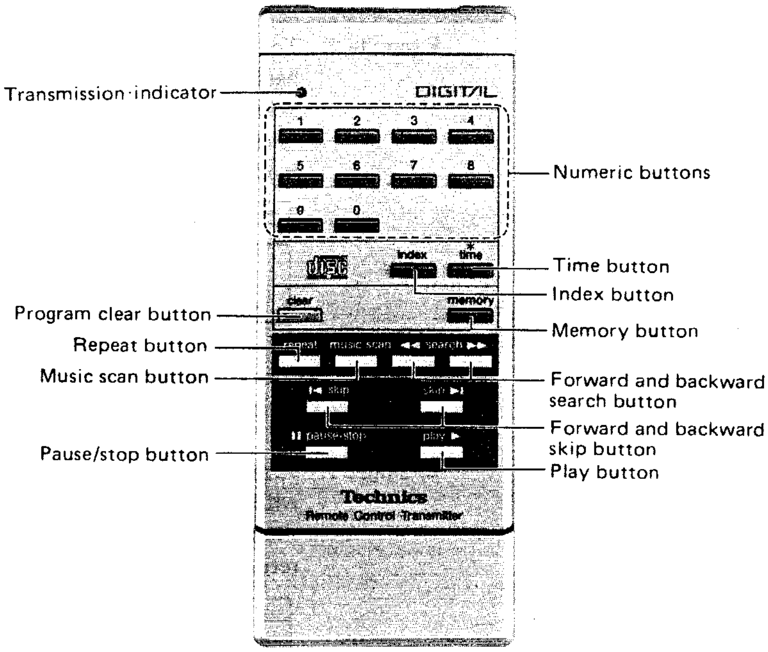
- **Top view**



- **Optical deck unit (Bottom view)**


Disc holder open/close motor
Traverse motor
Head amplifier P.C.B.
Spindle motor drive coil P.C.B.
Laser P.C.B.
Head amplifier P.C.B.
Photo detector

- **Remote control unit**


Transmission indicator
DIGITAL
1
2
3
4
5
6
7
8
9
0
Numeric buttons
disc
index
time
Time button
Index button
Program clear button
clear
memory
Memory button
Repeat button
repeat
music scan
◀◀ search ▶▶
Music scan button
Forward and backward search button
skip
Forward and backward skip button
pause/stop
play ▶
Pause/stop button
Play button
Technics
Remote Control Transmitter

- **Remote control unit functions**

> All operations except those listed below can be performed with the remote control unit in the same manner as with the front panel controls.

1. Power on/off
2. Headphones level control
3. Disc holder open/close button operation
4. Auto-pause/timer play settings
5. Pitch control adjustment
6. Pitch switch on/off

- **Notes**

- Always aim the remote control unit at the front panel receiver.
- The remote control unit can be used at an angle of up to 60° from the direction in which the front panel faces.
- The remote control unit can not be used from a distance of more than 7 meters.

■ PLAYING A DISC

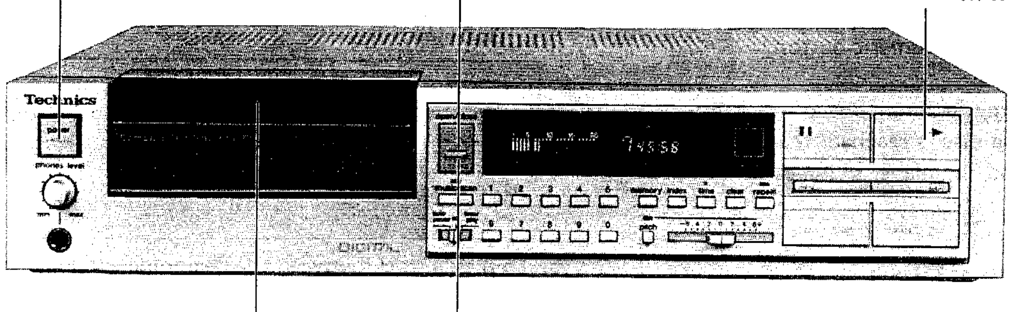
1. Automatic Play

(To play a disc from beginning to end)

1. Press the power switch to the on position.

2. Press the disc holder open/close button.
(Disc holder opens)

5. Press the play button.
- The track number segment of the track currently being played flashes on and off.
- When the end of the disc is reached, the pickup returns to the first track and the player switches to the standby mode.



4. Press the disc holder open/close button.
- After the open/close button is pressed to close the disc holder, the disc will automatically begin to spin and the number of tracks and total playing time will be read and displayed.
- If there are more than 20 tracks on the disc, the overrun indicator (▶) to the right of the track number segment display will light.

3. Insert a disc.

Note:
Since steps 1 ~ 4 in this procedure are the same for all disc play procedures, they are not included in the following explanations.

- **To briefly interrupt disc play**
  Press the pause/stop button to activate the pause mode (**II** indicator lights). Be careful not to hold the pause/stop button down more than about one second since this will switch the player to the stop mode.
  Press the play button to resume disc play.

- **To stop disc play**
  Hold the pause/stop button down for about one second until the **II** indicator lights off.
  The pickup will return to the beginning of the first track and the player will switch to the standby mode.
  Turn the power switch off if the player is not going to be used for a while.

- **The remaining playing time display**
  Press the time button to switch the time display to the remaining playing time mode.
  To return to the elapsed playing time mode, press the time button again.
  Remember that the remaining time can only, be displayed during standard disc play and random access play (when disc play is started from a specific track, index or time).

2. To Play A Disc From A Specific Track (track random access)

(For example, to start disc play from track 3)

Procedure

1. Press the number 3 of the numeric button.
2. Press the play button.
3. Disc play begins from track 3 and the track 3 segment flashes on and off.
4. When the end of the disc is reached, the pickup returns to the first track and the player switches to the standby mode.

3. To Play A Disc From A Specific Index (index random access)

- **When specifying an index number obtained from the disc's liner note.**
  (For example, to start disc play from track 3, index 2.)

Procedure:

1. Press the number 3 of the numeric button.
2. Press the index button.
3. Press the number 2 of the numeric button.
4. Press the play button.
5. Disc play begins from index 2 of track 3 and the track 3 segment flashes on and off.
6. When the end of the disc is reached, the pickup returns to the first track and the player switches to the standby mode.

4. To Play A Disc From A Specific Point Within A Track (time random access)

(For example, to start disc play from the 2 min. 38s. point of track 5.)

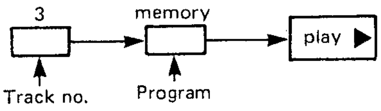
Procedure:

1. Press the number 5 of the numeric button.
2. Press the time button.
3. Press the number 2 of the numeric button.
4. Press the time button.
5. Press the number 3 of the numeric button.
6. Press the number 8 of the numeric button.
7. Press the play button.
8. Disc play begins from the 2 min, 38s. of track 5.
9. When the end of the disc is reached, the pickup returns to the first track and the player switches to the standby mode.

5. Program Disc Play

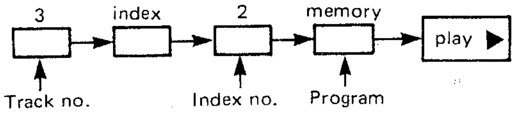
- **To program only one track (single program)**

1. To play one track from beginning to end.
(Example: To play track 3 from beginning to end.)

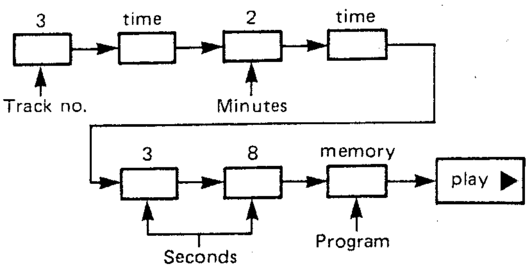

3
memory
play ▶
Track no.
Program

- Only the track number segment of the programmed track will light and then flash on and off while the track is being played.
- The player switches to the standby mode after track 3 has been played.

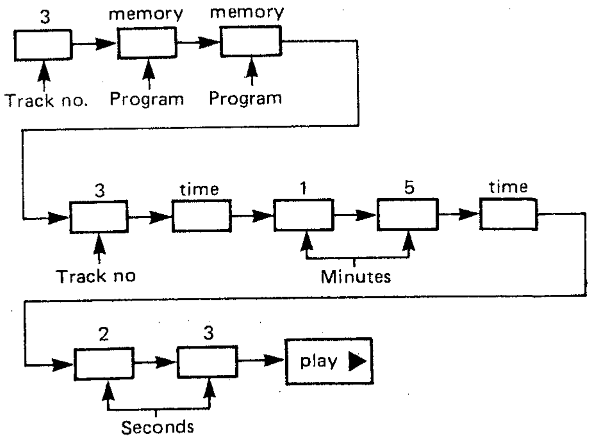
2. To play an index
(Example: To play track 3, index 2.)


3
index
2
memory
play ▶
Track no.
Index no.
Program

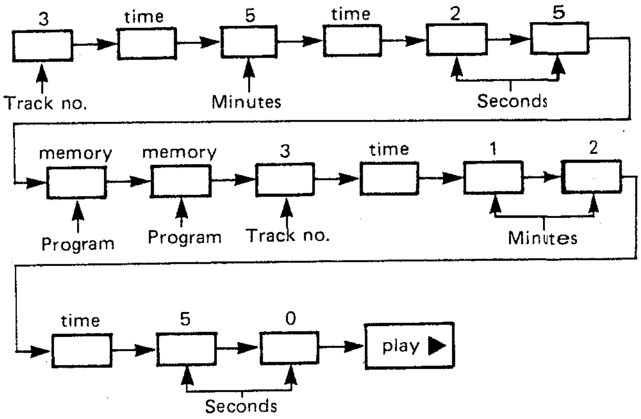
3. To play a track from the middle to the end.
(Example: To play track 3 from the 2 min. 38s. point to the end.)


3
time
2
time
Track no.
Minutes
3
8
memory
play ▶
Seconds
Program

4. To play a track from the beginning to the middle.
(Example: To play track 3 from the beginning to the 15 min. 23s. point.)

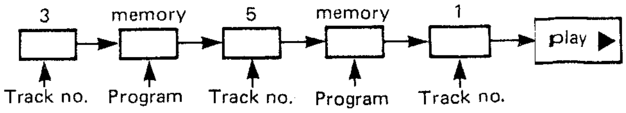

3
memory
memory
Track no.
Program
Program
3
time
1
5
time
Track no
Minutes
2
3
play ▶
Seconds

5. To play a track between the beginning and end.
(Example: To play track 3 from the 5 min. 25s. point to the 12 min. 50s. point.)


3
time
5
time
2
5
Track no.
Minutes
Seconds
memory
memory
3
time
1
2
Program
Program
Track no.
Minutes
time
5
0
play ▶
Seconds

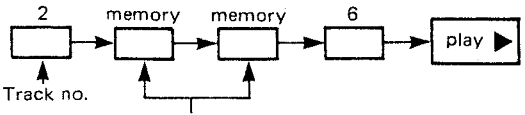
- **To program more than one track (multi-program)**

1. To play several tracks out of order
(Example: To play track 3, track 5 and track 1 in that other.)


3
memory
5
memory
1
play ▶
Track no.
Program
Track no.
Program
Track no.

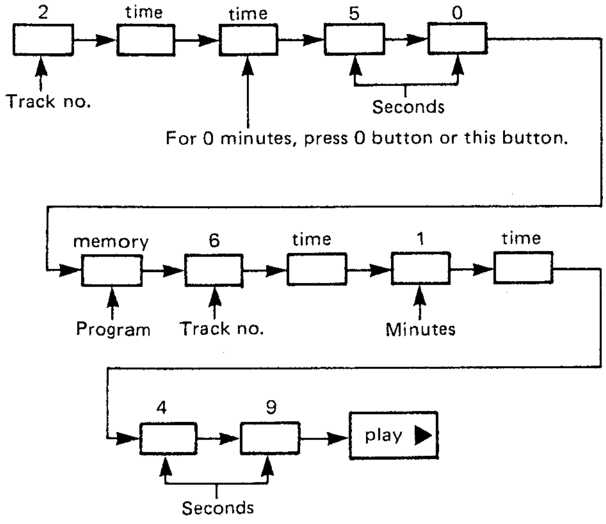
- Only the segments of the programmed tracks light; all other segments remain out.
- The segment of the track currently being played flashes on and off.
- To change a program entry, press the program clear button before the memory button is pressed. The program is now cancelled from that point onward.

2. To play several consecutive tracks.
(Example: To play a disc from track 2 through track 6.)


2
memory
memory
6
play ▶
Track no.

For continuous play, press the memory button twice. It is not necessary to enter each track.
This abbreviated procedure is not possible when programming disc play from track 6 back to track 2, however.

3. To play one track from the middle to the end and then a second track from the middle to the end.
(Example: To play the second track from the 50s. point the end and then the sixth track from the 1 min. 49s. point to the end.)


2
time
time
5
0
Track no.
Seconds
For 0 minutes, press 0 button or this button.
memory
6
time
1
time
Program
Track no.
Minutes
4
9
play ▶
Seconds

- **To enter a program during disc play**

A new program can be entered while a disc is being played even if the program clear button is not pressed. When the new program is entered, the previous programs will still be erased and disc play based on the new program will begin.

Note:

- When entering a program during disc play, the program buttons must be operated without interruption. If there is a gap of more than 20 seconds between the time two program buttons are pressed, the new program will not be entered and disc play will continue in the normal manner.

- **To cancel a program**

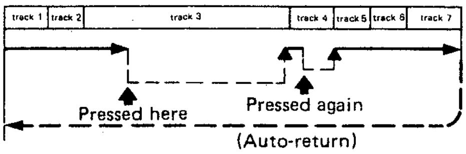
Press the program clear button. The program will be cleared from the memory and disc play will continue in the normal manner.

6. Skip Play

Skip play can be performed when the player is in the play or pause mode.

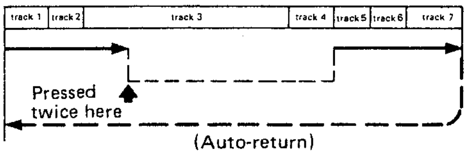
- **To move to the beginning or the next track or several tracks ahead (forward skip)**

Example 1: When the forward skip button is pressed while listening to the third track to advance to the beginning of the fourth track and then again to advance to the beginning of the fifth track.


track 1
track 2
track 3
track 4
track 5
track 6
track 7
Pressed here
Pressed again
(Auto-return)

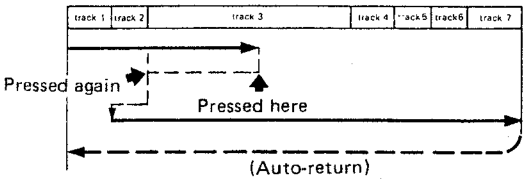
During program disc play, the pickup moves to the beginning of the next programmed track when the forward skip button is pressed.
The pickup moves to the next track (or programmed track) each time this button is pressed.

Example 2: To skip directly from the third track to the beginning of the fifth track, press the forward skip button twice in a row.
(Skips to the beginning of the next programmed track during program disc play.)


track 1
track 2
track 3
track 4
track 5
track 6
track 7
Pressed twice here
(Auto-return)

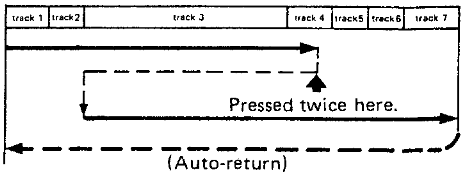
- **To return to the beginning of the present track or any previous track (backward skip)**

Example 1: When the backward skip button is pressed while listening to the third track to return to the beginning of that track and then again to return to the beginning of the second track.


track 1
track 2
track 3
track 4
track 5
track 6
track 7
Pressed again
Pressed here
(Auto-return)

During program disc play, the pickup moves to the beginning of the previous programmed track when the backward skip button is pressed.
The pickup returns to the previous track (or programmed track) each time this button is pressed.

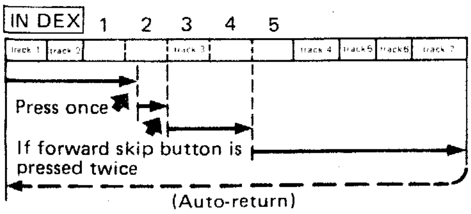
Example 2: To return to the beginning of track 3 when track 4 is being played.


track 1
track 2
track 3
track 4
track 5
track 6
track 7
Pressed twice here.
(Auto-return)

- **To move to the beginning of a specific index**

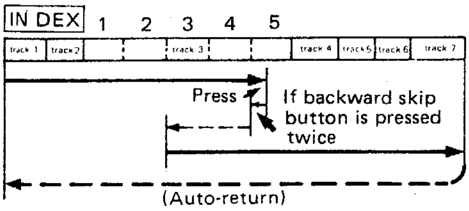
This function is only possible with discs having index numbers. For example, while playing index 2 of track 3 which contains a total of 5 indexes on a disc that has seven tracks:

Press the index button and then the forward skip button once to move to the beginning of the next (third) index.


IN DEX
1
2
3
4
5
track 1
track 2
track 3
track 4
track 5
track 6
track 7
Press once
If forward skip button is pressed twice
(Auto-return)

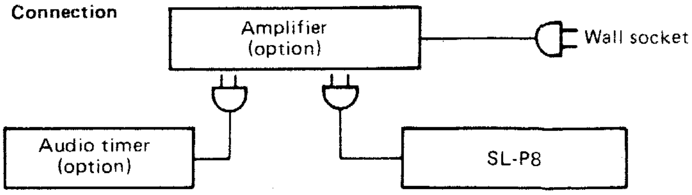
- **To return to the beginning of a specific index**

Press the index button and then the backward skip button once to return to the beginning of the previous index.


IN DEX
1
2
3
4
5
track 1
track 2
track 3
track 4
track 5
track 6
track 7
Press
If backward skip button is pressed twice
(Auto-return)

7. Timer Play

Connection


Amplifier (option)
Wall socket
Audio timer (option)
SL-P8

Operations

1. Turn on the power switches of all components in the timer play chain.

Note:
The audio timer should be off at this time.

2. Set the auto-pause/timer switch to the timer play position.
3. Insert a disc in the holder.
4. Confirm the present time and set the audio timer to the desired start and stop times.
5. Turn the audio timr on. The audio timer will now turn power off to all components in the time play chain.
6. The disc will now be played from track one at the preset time.

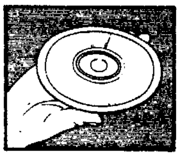
■ HANDLING COMPACT DISCS

- **Handling precautions**

Only compact discs identified with this mark can be used with this player.

COMPACT disc DIGITAL AUDIO

- Hold compact discs by the edges so the surface is not soiled with fingerprints.



- Be careful not to scratch the surface with fingernails or other sharp objects, particularly when inserting and removing discs in their cases.
- Do not bend the disc.
- Do not use record cleaning sprays or static electricity prevention liquids.
- Do not wipe with benzene, thinner or any other solvent. If the surface is soiled, wipe gently with a soft damp (water only) cloth.
- If the disc is brought from a cold environment into a warm room, dew may form on the disc. Wipe this off with a soft, dry cloth before using the disc.
- Do not write on the label with a ball-point pen, hard pencil or other hard writing utensil.
- **Always remove the disc from the disc compartment when you have finished listening to it.**

- **Storage precautions**
  - Be sure to store discs in their cases to protect them from dust, scratches and warping.
  - Do not place or store discs in the following places:
    1) Locations exposed to direct sunlight.
    2) Locations with high humidity or a lot of dust.
    3) Locations directly exposed to a heat outlet or heating appliance.
    4) In the glove compartment or rear ledge of an automobile.

DISASSEMBLY INSTRUCTIONS

How to remove the cabinet

1. Remove the 4 setscrews [Fig. 1: ❶ ~ ❹] of cabinet.
2. Remove the cabinet in the direction of the arrow. [Fig 1]

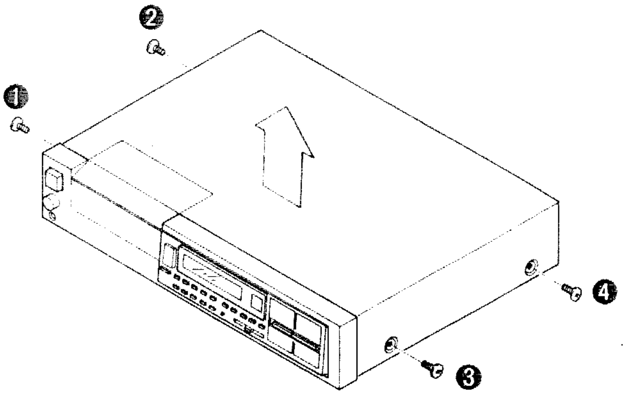


Fig. 1

How to remove the servo P.C.B.

1. Remove the cabinet.
2. Release the 2 claws of the holder. [Fig. 2]
3. Hold the stopper with pincers or the like and raise the P.C.B. in the direction of arrow Ⓐ. [Fig. 2]
4. When the servo circuit, digital circuit and pitch control circuit boards are checked, they should be in positions as in Fig. 3.
5. Release the 3 claws of the holder, then the servo circuit P.C.B. can be removed. Fig. 3]

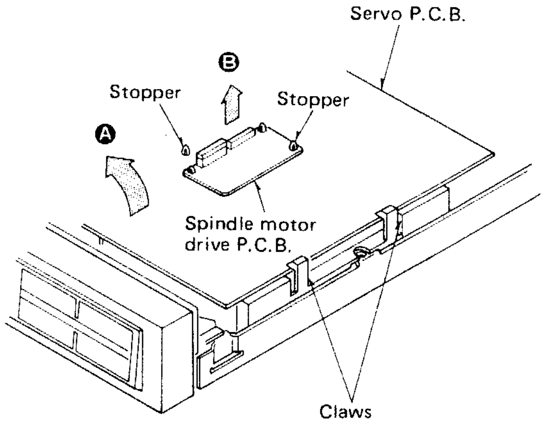

Servo P.C.B.
Ⓑ
Stopper
Stopper
Ⓐ
Spindle motor drive P.C.B.
Claws

Fig. 2

How to remove the pitch control P.C.B. and reset P.C.B.

1. Remove the cabinet.
2. Raise the servo P.C.B. as shown in Fig. 3.
3. Remove the P.C.B. setscrew [Fig. 3: ❺].

Note:

Digital P.C.B. is grounded to chassis with ground terminal fastened with screw❺. Connect ground terminal to chassis before power supply.

How to remove the regulator IC (IC81, IC82)

1. Remove the cabinet.
2. Raise the servo P.C.B. as shown in Fig. 3.
3. Remove the radiator setscrew [Fig. 3: ❻] of regulator IC.
4. Completely remove solder from IC terminal.
5. Remove the IC setscrew [Fig. 3: ❼].
6. When fitting the IC, be sure to set the insulator seat and bushing in place.
   [Insulator seat: SFDCC07-01; Bushing: SFDBC07-01]

How to remove the spindle motor drive P.C.B.

1. Remove the cabinet.
2. Hold the stoppers of P.C.B. with pincers or the like, then remove the P.C.B. in the direction of arrow Ⓑ. [Fig. 2]

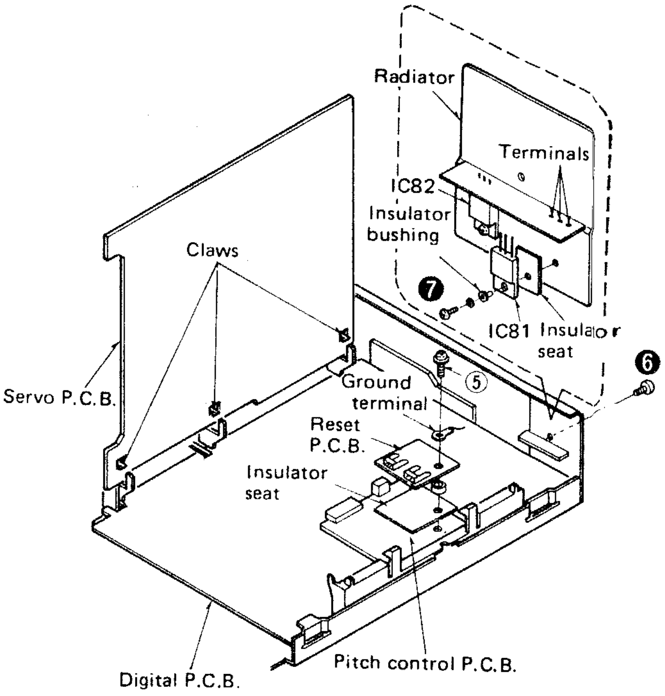

Radiator
Terminals
IC82
Insulator bushing
Claws
❼
IC81
Insulator seat
❻
Ground terminal
⑤
Reset P.C.B.
Insulator seat
Servo P.C.B.
Digital P.C.B.
Pitch control P.C.B.

Fig. 3

• How to remove the front panel

1. Remove the cabinet.
2. Pull out the power switch rod in the direction of arrow Ⓐ. [Fig. 4]
3. Remove the 4 setscrews [Fig. 4: ⑧ ~ ⑪] of front panel.
4. Remove the front panel in the direction of arrow Ⓑ with care not to scratch the disc holder. [Fig. 4]
5. Raise the servo P.C.B. as in Fig. 3.
6. Remove the 8 connectors (CN208, CN216, CN209, CN211, CN206, CN207, CN213) of digital P.C.B. and the 2 pin connector of the reset P.C.B., then the front panel can be removed.

Cautions:

1. When installing the power switch rod, set it through the lead wire as in **Fig. 4-1.**
2. When installing the cabinet, take care not to squeeze the lead wire.

• How to remove the headphone jack and headphone level control volume

1. Remove the front panel.
2. Pull out the level control knob.
3. Remove the 2 headphone jack fitting setscrews [Fig. 5: ⑫, ⑬]
4. Remove the 2 nuts [Fig. 5: ⑭, ⑮] of headphone jack and level control volume.

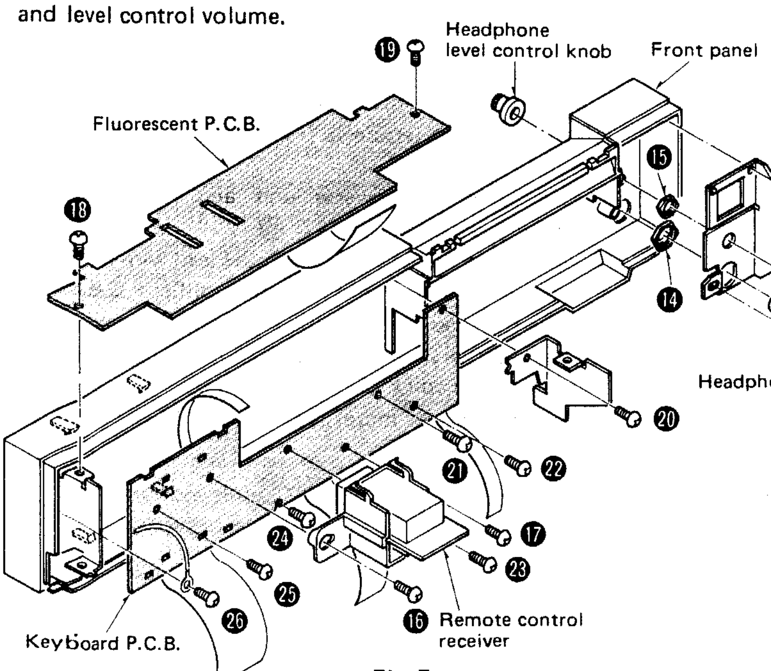

⑲
Headphone level control knob
Front panel
Fluorescent P.C.B.
⑱
⑮
⑫
⑭
Headphone jack
⑬
⑳
㉑
㉒
⑰
㉔
㉓
㉕
㉖
⑯ Remote control receiver
Keyboard P.C.B.

Fig. 5

• How to remove the remote control receiver

1. Remove the front panel.
2. Remove the 2 setscrews [Fig. 5: ⑯, ⑰] of receiver.
3. To remove the parts on P.C.B. . . . . [Fig. 6]
   ① Hold the 2 claws of shield case, then remove the filter.
   ② Pull the holder out of the P.C.B.
   ③ Remove solder at 4 portions of the shield case.

• How to remove the fluorescent P.C.B.

1. Remove the front panel.
2. Remove the remote control receiver.
3. Remove the 2 setscrews [Fig. 5: ⑱, ⑲] of fluorescent P.C.B., then the fluorescent P.C.B. can be removed.

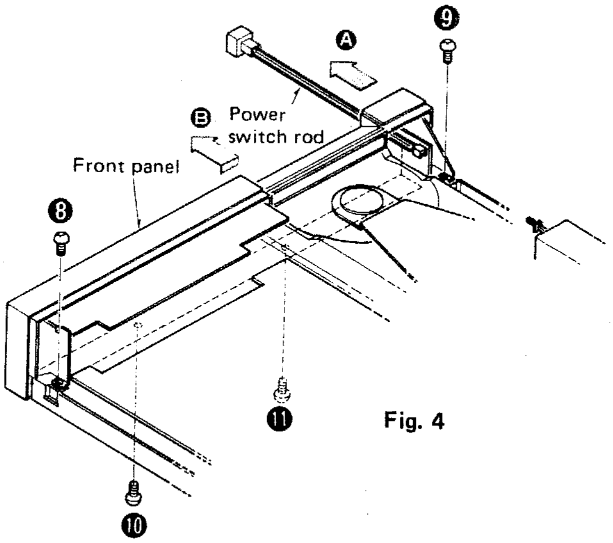
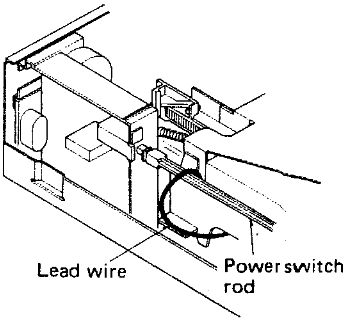

⑨
Ⓐ
Ⓑ Power switch rod
Front panel
⑧
⑪
⑩

Fig. 4


Lead wire
Power switch rod

[Fig. 4-1]

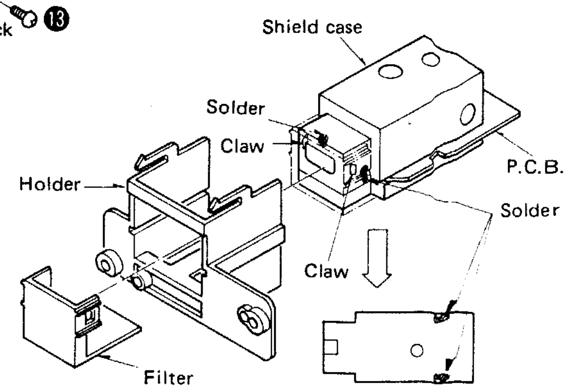

Shield case
Solder
Claw
Holder
P.C.B.
Solder
Claw
Filter

Fig. 6

• How to remove the keyboard P.C.B.

1. Remove the front panel.
2. Remove the remote control receiver.
3. Remove the fluorescent P.C.B.
4. Remove the 7 setscrews [Fig. 5: ⑳ ~ ㉖] of P.C.B. and release the 4 claws, then the keyboard P.C.B. can be removed.

• How to remove the digital P.C.B.

1. Remove the front panel.
2. Pull out the connector CN201 (from constant voltage P.C.B.) and CN214 (from regulator IC's P.C.B.) of digital P.C.B.
3. Pull out the connector CN107 (from constant voltage P.C.B.) and CN101 ~ CN106, CN109, CN552 (from optical deck unit) of servo P.C.B.
4. Remove the 3 setscrews [**Fig. 7:** ㉗ ~ ㉙] of P.C.B. holder.
5. Remove the digital P.C.B. in the direction of the arrow. [**Fig. 7**]

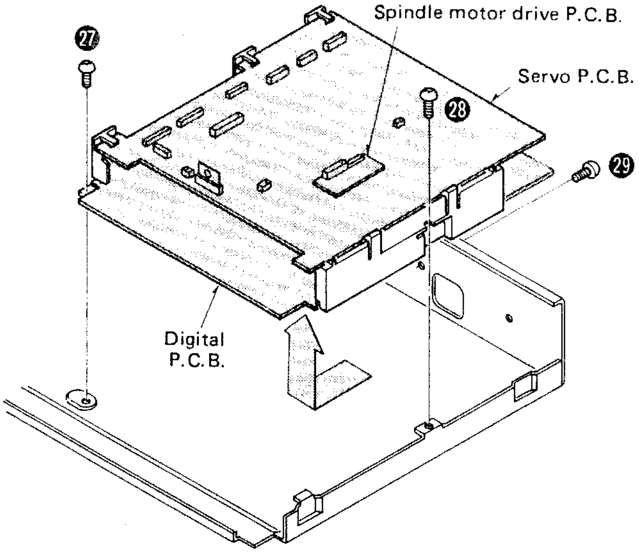

Spindle motor drive P.C.B.
Servo P.C.B.
㉗
㉘
㉙
Digital P.C.B.

Fig. 7

***Precautions for removal of MN6616 and MN6806**

MN6616 and MN6806 attached to the digital P.C.B. are radiated by the radiator column. When fitting LSI, apply silicone compound (or equivalent head diffusing agent) to the radiator column. [**Fig. 8**]

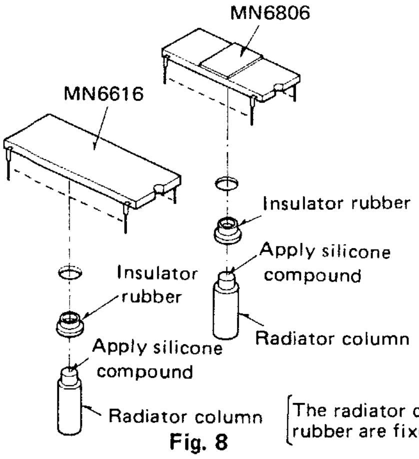

MN6806
MN6616
Insulator rubber
Apply silicone compound
Insulator rubber
Radiator column
Apply silicone compound
Radiator column

Fig. 8

[The radiator column and insulation rubber are fixed (glued) on P.C.B.]

• How to remove the disc clamper

1. Remove the cabinet.
2. Shift the disc holder forward.
3. Remove the disc clamper setscrew [**Fig. 9:** ㉚]
4. Remove the spring in the direction of arrow Ⓐ . [**Fig. 9**]
5. Remove the disc clamper in the direction of arrow (Ⓑ , Ⓒ).
   Note:
   Shift the disc holder forward to remove th disc clamper.
6. To remove the magnet of disc clamper, hold the magnet fixing plate with pliers and turn it clockwise.

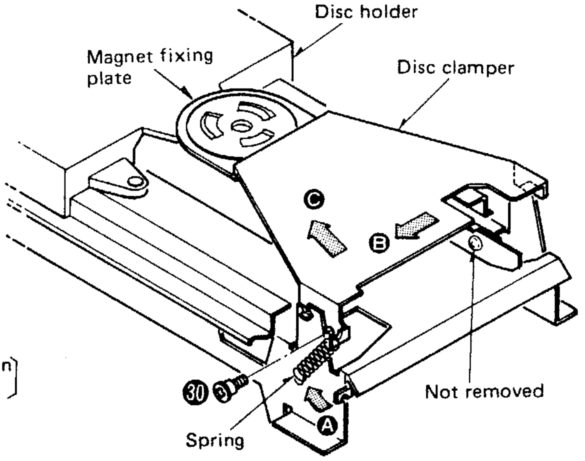

Disc holder
Magnet fixing plate
Disc clamper
Ⓒ
Ⓑ
㉚
Not removed
Ⓐ
Spring

Fig. 9

• How to remove the power transformer

1. Remove the cabinet.
2. Shift the disc holder forward.
3. Remove the switch rod from the power switch.
4. Remove the 2 setscrews [**Fig. 10:** ㉛ , ㉜] of power transformer.
5. Remove the radiator setscrew [**Fig. 10:** ㉝] and take the power transformer block out of the chassis.
6. Remove the 2 setscrews [**Fig. 10:** ㉞ , ㉟] of constant voltage P.C.B.
7. Remove solder at 8 portions of constant voltage P.C.B.
8. Remove the 2 setscrews [**Fig. 10:** ㊱ , ㊲] of fuse P.C.B. holder.
9. Remove solder on the fuse P.C.B. to detach the P.C.B., and then the power transformer can be removed.

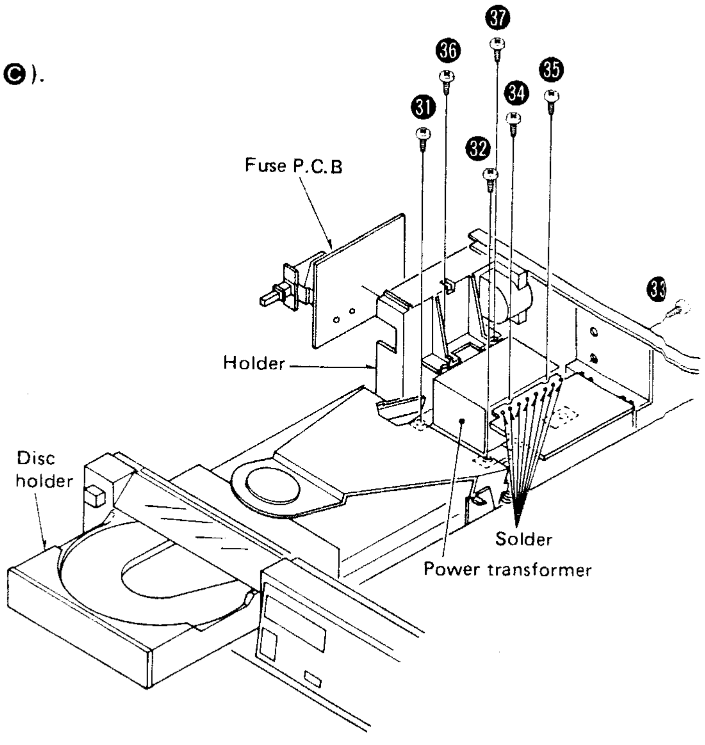

㊲
㊱
㉟
㉞
㉛
㉜
Fuse P.C.B
㉝
Holder
Disc holder
Solder
Power transformer

Fig. 10

• How to remove the disc holder

1. Remove the front panel.
2. Remove the disc clamper.
3. Remove the disc holder setscrews [**Fig. 11**: ㊳ , ㊴].
4. Disconnect the lead wire from the lead wire holder.
   [Take care not break the lead wire.]
5. Push the disc holder in the direction of arrow Ⓐ and release the 2 claws from the bottom, then remove the disc holder by lifting it in the direction of arrow Ⓑ.

***Fit the disc holder with the drive rack pressed in the direction of arrow Ⓒ .**

• How to remove and set the disc tray

1. Remove the disc holder.
2. Release the 2 claws from the bottom of disc holder and then remove the disc tray.
   [In this case, be careful not to lose the 3 ball bearings.]
3. When setting the disc tray, accurately fit the lever onto the boss as illustrated.

***It can be easily set by pushing the lever in the direction of the arrow. [Fig. 12]**

• How to remove the loading guide

1. Remove the disc holder.
2. Release the 2 claws of close switch cover to release the switch [**Fig. 13**]
3. Remove the 6 setscrews [**Fig. 11**: ㊵ ~ ㊺] on the right and left sides of loading guide holder.
   Then the loading guide can be removed.

***When fitting the close switch and return gear again, push the drive rack in the direction of the arrow and set them so that the return gear spring is set on the left side. [See Fig. 14] (The – marked gear of return gear is engaged between the 2nd and 3rd from top of the drive rack gears.)**

• How to remove the drive rack

1. Remove the loading guide.
2. Release the return gear claw to remove the return gear. [**Fig. 13**]
3. Push the drive rack in the direction of arrow Ⓐ , and release the drive rack claw, then the drive rack can be removed downward. [**Fig. 13**]

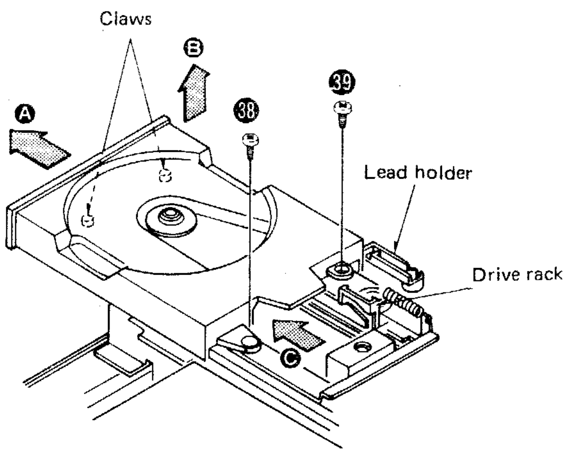

Claws
Ⓑ
㊴
Ⓐ
㊳
Lead holder
Drive rack
Ⓒ

Fig. 11

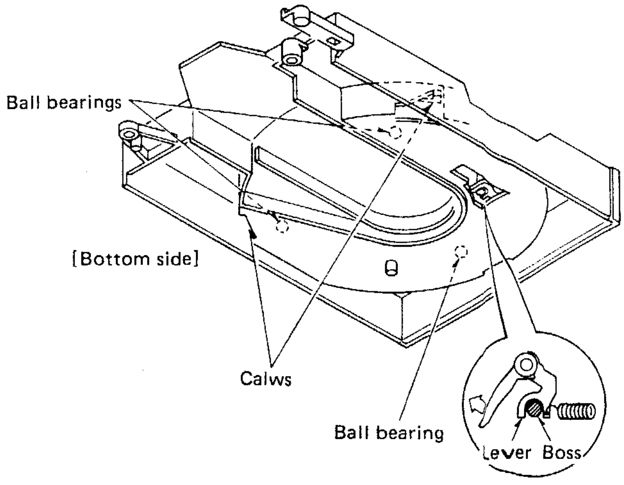

Ball bearings
[Bottom side]
Calws
Ball bearing
Lever Boss

Fig. 12

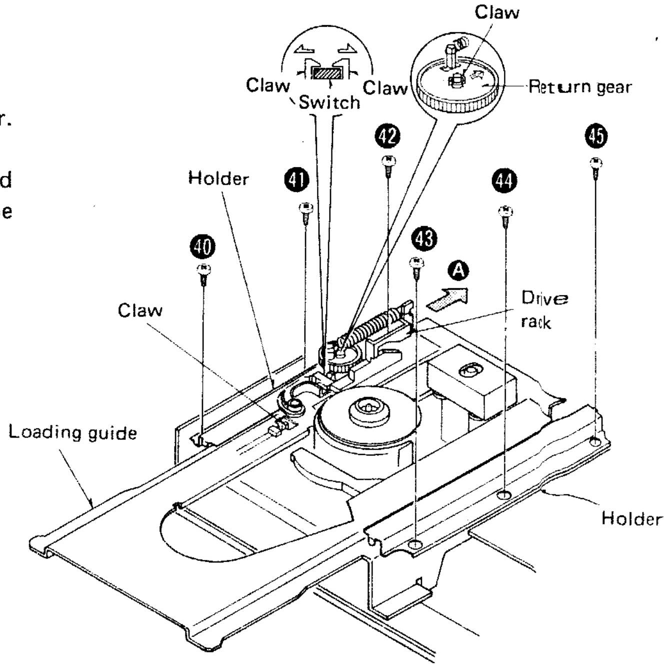

Claw
Claw
Switch
Claw
Return gear
㊷
㊺
Holder
㊶
㊹
㊵
㊸
Ⓐ
Claw
Drive rack
Loading guide
Holder

Fig. 13

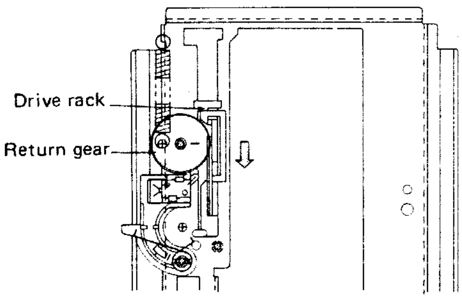

Drive rack
Return gear

Fig. 14

• How to remove the traverse unit ass'y (optical deck unit)

1. Remove the front panel.
2. Remove the 4 setscrews [**Fig. 15:** ㊻ ~ ㊾] of traverse unit. Screws ㊻ ~ ㊾ are red.
3. Pull out the connectors (CN101 ~ CN106, CN109, CN552) connected from traverse unit to servo P.C.B.
4. Pull out the earth terminal connected from traverse unit to chassis.
5. Turn over the traverse unit and remove the nuts [**Fig. 16:** ㊿ ~ (53)], then the traverse unit ass'y can be removed.
   Note that the front and rear springs are different in color.

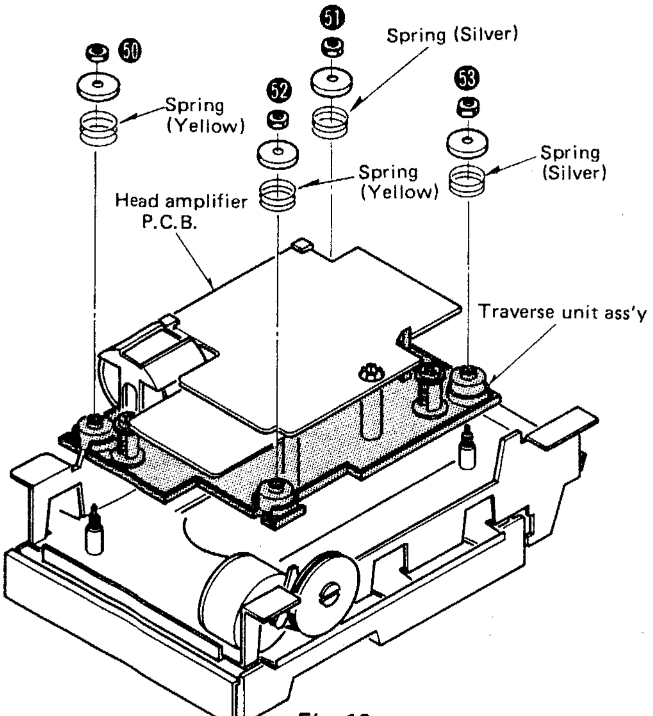

㊿
Spring (Yellow)
(51)
Spring (Silver)
(52)
(53)
Spring (Yellow)
Spring (Silver)
Head amplifier P.C.B.
Traverse unit ass'y

Fig. 16

Replacement parts are supplied in the from of traverse unit ass'y (optical deck unit) for the time being. So, do not remove the limit switch, motor, turntable and pickup.
Refer to "How to remove the limit switch, turntable, and laser pickup" given in the next paragraph only after switchover from ass'y supply to individual unit supply of traverse units.

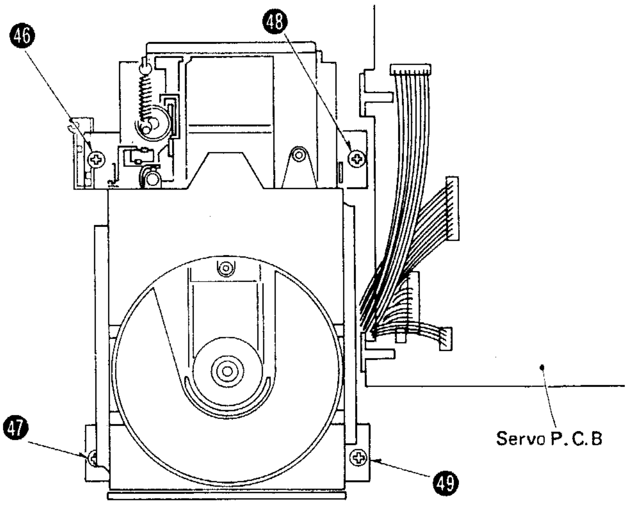

㊻
㊽
㊼
㊾
Servo P.C.B

Fig. 15

• How to remove the head amplifier P.C.B. and spindle motor drive coil P.C.B.

1. Remove the 4 setscrews [**Fig. 15:** ㊻ ~ ㊾] of traverse unit.
2. Turn over the traverse unit and remove the head amplifier setscrew [**Fig. 17:** (54)].
3. Disconnect the lead wire from the lead wire holder.
4. Release the claw from the head amplifier P.C.B.
   Then the head amplifier P.C.B. can be removed.
5. Remove the 2 setscrews [**Fig. 17:** (55) , (56)] of spindle motor drive coil P.C.B.
   Then the spindle motor drive coil P.C.B. can be removed.

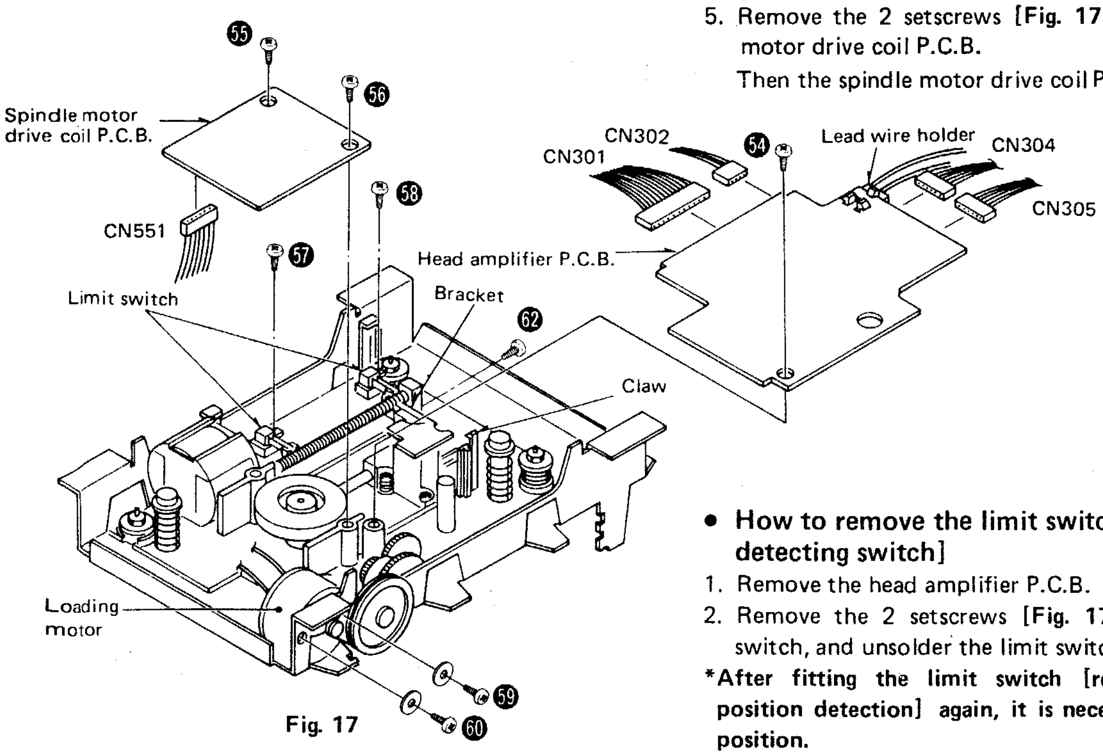

(55)
(56)
Spindle motor drive coil P.C.B.
CN551
(58)
(57)
Limit switch
CN302
CN301
(54)
Lead wire holder
CN304
CN305
Head amplifier P.C.B.
Bracket
(62)
Claw
Loading motor
(59)
(60)

Fig. 17

• How to remove the limit switch [Rest and end detecting switch]

1. Remove the head amplifier P.C.B.
2. Remove the 2 setscrews [**Fig. 17:** (57) , (58)] of limit switch, and unsolder the limit switch.

***After fitting the limit switch [rest: disc's innermost position detection] again, it is necessary to re-adjust the position.**

• How to remove the loading motor

1. Remove the head amplifier P.C.B.
2. Remove the belt from the loading motor pulley.
3. Remove the 2 setscrews [**Fig. 17:** (59) , (60)] of loading motor, and unsolder the motor leads.

* Connect the brown lead to the (+) terminal of motor, and red lead to (−) terminal. (The (−) terminal is indicated by arrow on the motor.)

• How to remove the turntable

1. Remove the traverse unit.
2. Remove the spindle motor drive coil P.C.B.
3. Remove the C ring which fastens the magnet shaft of spindle motor. [**Fig. 18**]
4. Remove the screw [**Fig. 18:** (61)] by use of a hexagonal wrench, then the turntable can be removed.

***If the turntable is removed, it is necessary to re-adjust the height of turntable.**

• How to remove the laser pickup

1. Remove the traverse unit.
2. Remove the head amplifier P.C.B.
3. Pull out the connectors (CN304, CN305) of head amplifier P.C.B.
4. Remove the bracket setscrew [**Fig. 17:** (62)] of pickup to remove the bracket.
5. Remove the guide rail retainer setscrew [**Fig. 18:** (63)] and pull out the laser pickup from the two guide rails.

***The pickup must be re-adjusted when it is replaced or fitted after removal.**

• How to remove the remote control (transmitter) P.C.B.

1. Remove the battery cover in the direction of the arrow [**Fig. 19**].
2. Remove the battery and battery cover setscrew [**Fig. 19:** (64)].
3. Insert a screwdriver between the top and bottom covers inside the battery compartment and gradually loosen the bottom cover. [**Fig. 20**]
4. Similarly loosening the cover along the periphery, remove the bottom cover.
5. Pressing the whole body of P.C.B. in the direction of arrow Ⓐ, push the 3 claws on the opposite side in the direction of arrow Ⓑ to remove the P.C.B. from the top cover. [**Fig. 21**]

Caution: Be sure to remove the P.C.B. with the top cover positioned as in **Fig. 21**. If the top cover is up, the button will be removed.

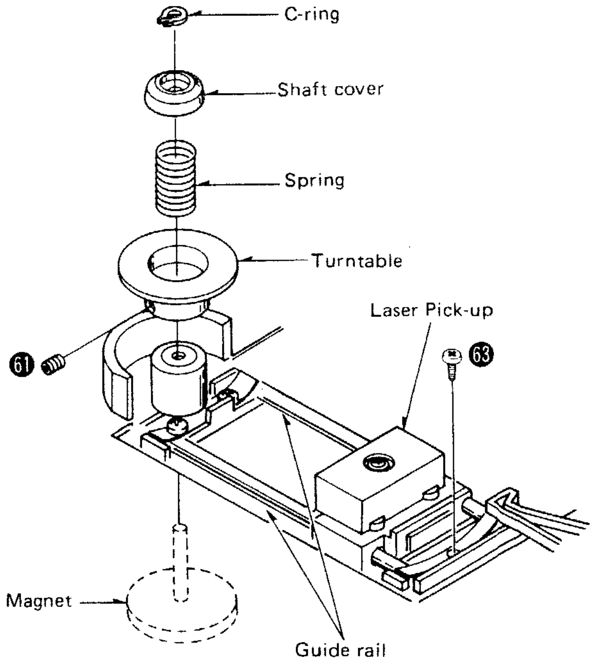


Fig. 18

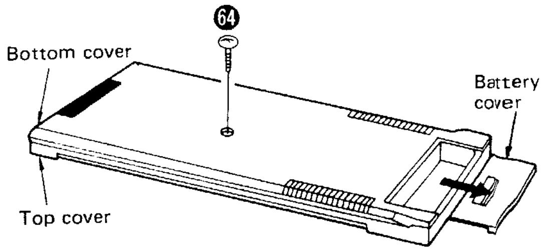


Fig. 19

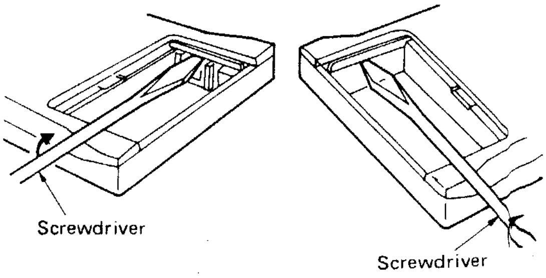


Fig. 20

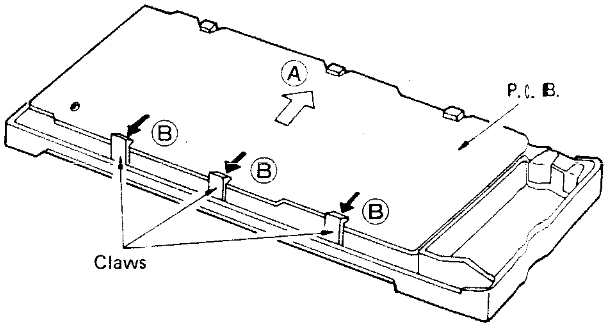


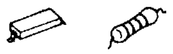
Fig. 21

HOW TO REPLACE CHIPS

(Resistor, capacitor and jumper)

- **Removing procedure**

1. Completely remove the solder from both ends of the chip by use of solder sucker.
2. Touch the soldering iron to the end of the chip as shown in Fig. 22, then turn the tweezers in the direction of the arrow.



Witout color cord With color cord

Chip resistor

Do not re-use chip resistor or capacitor without color cord.

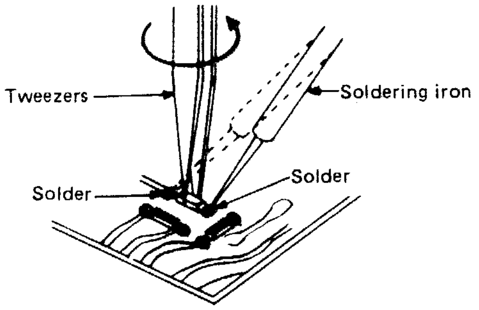


Fig. 22

- **Replacing procedure**

1. Place solder on the foil where the chip is fitted. Then solder the chip by holding the soldering iron as shown in Fig. 23.

Note:

1. If the chip jumper is removed, connect a coated lead wire to the part. (See Fig. 24). Chip jumper is marked with "J" on the printed circuit board.

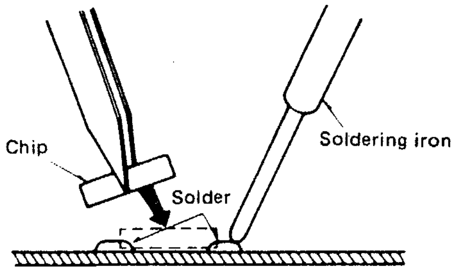


Fig. 23

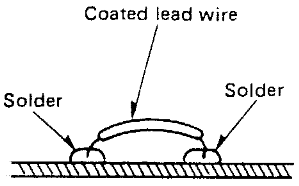
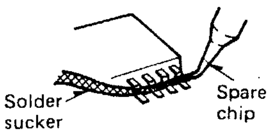
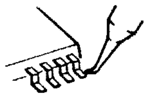
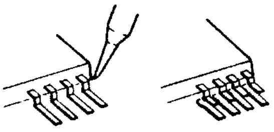
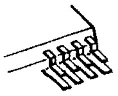


Fig. 24

- **Note for replacing chips**

1. Do not heat the chip more than 3 seconds.
2. Do not rub the electrode against the chip.
3. Use the tweezers with care not to damage the surface of the chip.
4. It is desirable to use a pencil type soldering iron. And use soldering iron less than 60W.

HOW TO REPLACE IC'S (Small outline type)

Replacing procedure			Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	 	● **Recommended tool** .... Special soldering iron (with spare chip) HM-354 ● Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. ● When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. ● When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

■ RESISTOR AND CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics importnat for safety. When replacing any of these components use only manufacturer's specified parts.
3. This "Ⓢ" mark is service standard parts and may differ from production parts.
4. Unless otherwise specified. All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ All capacitors are in MICROFARADS (μF) P = 10^{-6}μF.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

ERG	1	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	F : ±1%
ERG : Metal Oxide	1 : 1W	J : ±5%
ERX : Metal Film		G : ±2%

ERD10TLJ □□□ ——→ Chip type carbon (1/8W)
ECUV1H □□□ ——→ Chip type ceramic
ERDS2TJ □□□ ——→ Small type carbon (1/4W)
EROS2TKF □□□ ——→ Small type metal film (1/4W)

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage		Tolerance
	ECEA Type	Others	
ECEA : Electrolytic	1A : 10V	1H : 50V DC	J : ±5%
ECKD : Ceramic	1C : 16V	2H : 500V DC	K : ±10%
ECQM : Polyester	1E : 25V	1 : 100V	Z : +80%, −20%
ECCD : Ceramic	1V : 35V	AL: 125V AC	P : +100%, −0%
ECKF : Ceramic	1H : 50V	MY: 125V AC	M : ±20%
	1J : 63V	KC: 400V AC	
	50 : 50V	HS: 400V AC	

Ref. No.	Part No	Value
R1,2 Ⓢ⚠	ERD25FJ100	10
R81	ERDS2TJ222	2.2K
R82,83	ERDS2TJ472	4.7K
R84A	ERDS2TJ152	1.5K
R84B Ⓢ⚠	ERD25FJ100	10
R85	ERDS2TJ561	560
R101	ERDS2TJ103	10K
R102	ERDS2TJ682	6.8K
R103	ERDS2TJ472	4.7K
R104	ERDS2TJ103	10K
R105	ERDS2TJ102	1K
R106	ERDS2TJ220	22
R107	ERDS2TJ474	470K
R108	ERDS2TJ220	22
R109,110	ERDS2TJ473	47K
R111	ERDS2TJ271	270
R112	ERDS2TJ101	100
R113	ERDS2TJ104	100K
R114	ERDS2TJ682	6.8K
R115,116	ERDS2TJ471	470
R117	ERDS2TJ682	6.8K
R118	ERDS2TJ473	47K
R119	ERDS2TJ392	3.9K
R120	ERDS2TJ102	1K
R121	ERDS2TJ472	4.7K
R122	ERDS2TJ334	330K
R123	ERDS2TJ102	1K
R124,125	ERDS2TJ183	18K
R126	ERDS2TJ822	8.2K
R127	ERDS2TJ822	8.2K
R128	ERDS2TJ152	1.5K
R129	ERDS2TJ101	100
R130,131	ERDS2TJ102	1K
R132	ERDS2TJ392	3.9K
R133	ERDS2TJ222	2.2K
R134	ERDS2TJ183	18K
R135	ERDS2TJ152	1.5K
R136	ERDS2TJ183	18K
R137	ERDS2TJ822	8.2K
R138,139	ERDS2TJ102	1K
R140	ERDS2TJ472	4.7K
R141	ERDS2TJ101	100
R142	ERDS2TJ102	1K
R143	ERDS2TJ822	8.2K

Ref. No.	Part No.	Value
R201	ERDS2TJ563	56K
R202	ERDS2TJ153	15K
R203	ERDS2TJ334	330K
R204	ERDS2TJ183	18K
R205	ERDS2TJ393	39K
R206	ERDS2TJ123	12K
R207	ERDS2TJ101	100
R208	ERDS2TJ102	1K
R209	ERDS2TJ223	22K
R210	ERDS2TJ680	68
R211 S⚠	ERD25FJ1R0	1
R212	ERDS2TJ563	56K
R213	ERDS2TJ153	15K
R214	ERDS2TJ334	330K
R215	ERDS2TJ183	18K
R216	ERDS2TJ393	39K
R217	ERDS2TJ123	12K
R218	ERDS2TJ101	100
R219	ERDS2TJ102	1K
R220	ERDS2TJ223	22K
R221	ERDS2TJ560	56
R222 S⚠	ERD25FJ1R0	1
R223	ERDS2TJ222	2.2K
R224	ERDS2TJ104	100K
R225	ERDS2TJ103	10K
R226	ERDS2TJ473	47K
R227,228	ERDS2TJ223	22K
R229	ERDS2TJ223	22K
R230	ERDS2TJ103	10K
R231	ERDS2TJ104	100K
R232	ERDS2TJ103	10K
R233	ERDS2TJ273	27K
R234	ERDS2TJ473	47K
R235	ERDS2TJ823	82K
R236	ERDS2TJ154	150K
R237	ERDS2TJ103	10K
R238	ERDS2TJ123	12K
R239	ERDS2TJ562	5.6K
R240	ERDS2TJ822	8.2K
R241	ERDS2TJ103	10K
R242	ERDS2TJ472	4.7K
R243	ERDS2TJ823	82K
R244	ERDS2TJ473	47K
R245	ERDS2TJ101	100
R246	ERDS2TJ102	1K

Ref. No.	Part No.	Value
R247	ERDS2TJ273	27K
R248	ERDS2TJ103	10K
R249,250	ERDS2TJ273	27K
R251	ERDS2TJ823	82K
R252	ERDS2TJ822	8.2K
R253	ERDS2TJ154	150K
R254	ERDS2TJ103	10K
R255 S⚠	ERD25FJ2R2	2.2
R256	ERDS2TJ124	120K
R257	ERDS2TJ473	47K
R258,259	ERDS2TJ333	33K
R260	ERDS2TJ103	10K
R261	ERDS2TJ333	33K
R262	ERDS2TJ103	10K
R263	ERDS2TJ473	47K
R264	ERDS2TJ472	4.7K
R265	ERDS2TJ124	120K
R266	ERDS2TJ473	47K
R267,268	ERDS2TJ472	4.7K
R269,270	ERDS2TJ472	4.7K
R291	ERDS2TJ562	5.6K
R292	ERDS2TJ682	6.8K
R293	ERDS2TJ224	220K
R294	ERDS2TJ102	1K
R301	ERDS2TJ223	22K
R302	ERDS2TJ153	15K
R303,304	ERDS2TJ472	4.7K
R305	ERDS2TJ222	2.2K
R306	ERDS2TJ392	3.9K
R307	ERDS2TJ823	82K
R308	ERDS2TJ123	12K
R309	ERDS2TJ472	4.7K
R310,311	ERDS2TJ103	10K
R312	ERDS2TJ104	100K
R313	ERDS2TJ332	3.3K
R314	ERDS2TJ682	6.8K
R315,316	ERDS2TJ472	4.7K
R317,318	ERDS2TJ123	12K
R319 Ⓢ⚠	ERD25FJ560	56
R320	ERDS2TJ103	10K
R322	ERDS2TJ123	12K
R401	ERDS2TJ103	10K
R402	ERDS2TJ392	3.9K

Ref. No	Part No.	Value
R403	ERDS2TJ333	33K
R404	ERDS2TJ102	1K
R405,406	ERDS2TJ103	10K
R407	ERDS2TJ103	10K
R408	ERDS2TJ222	2.2K
R409	ERDS2TJ223	22K
R410	ERDS2TJ392	3.9K
R411	ERDS2TJ103	10K
R412	ERDS2TJ821	820
R413	ERDS2TJ273	27K
R414	ERDS2TJ473	47K
R415	ERDS2TJ123	12K
R416	ERDS2TJ561	560
R417	ERDS2TJ222	2.2K
R418	ERDS2TJ564	560K
R419	ERDS2TJ103	10K
R420	ERDS2TJ471	470
R421	ERDS2TJ561	560
R423	ERDS2TJ104	100K
R425	ERDS2TJ103	10K
R426	ERDS2TJ221	220
R427	ERDS2TJ332	3.3K
R431,432	ERDS2TJ103	10K
R433	ERDS2TJ392	3.9K
R434	ERDS2TJ103	10K
R435 S	ERD25FJ332	3.3K
R436 S	ERD25FJ392	3.9K
R437 S	ERD25FJ121	120
R438,439 S	ERD25FJ101	100
R440 Ⓢ	ERD25FJ182	1.8K
R441	ERDS2TJ561	560
R442	ERDS2TJ821	820
R443	ERDS2TJ152	1.5K
R444	ERDS2TJ101	100
R445,446	ERDS2TJ103	10K
R447	ERDS2TJ104	100K
R448	ERDS2TJ153	15K
R449	ERDS2TJ104	100K
R450	ERDS2TJ222	2.2K
R451 Ⓢ	ERG1ANJ101	100
R452,453	ERDS2TJ221	220
R454,455	ERDS2TJ822	8.2K
R456	ERDS2TJ103	10K
R457	ERDS2TJ102	1K

Ref No	Part No	Value
R458	ERDS2TJ103	10K
R460,461 S	ERD25FJ103	10K
R462 S	ERD25FJ103	10K
R501 S	ERX1ANJ1R5	1.5
R502 S	ERD25TJ333	33K
R503,504 S	ERD25FJ330	33
R551	ERDS2TJ153	15K
R552	ERDS2TJ392	3.9K
R554	ERDS2TJ824	820K
R555	ERDS2TJ333	33K
R556	ERDS2TJ392	3.9K
R557	ERDS2TJ124	120K
R558,559	ERDS2TJ104	100K
R560,561	ERDS2TJ104	100K
R562	ERDS2TJ104	100K
R563	ERDS2TJ103	10K
R564	ERDS2TJ332	3.3K
R565	ERDS2TJ333	33K
R566,567	ERDS2TJ103	10K
R568	EROS2TKF1002	10K
R569	ERDS2TJ334	330K
R570	ERDS2TJ394	390K
R571	ERDS2TJ153	15K
R572	ERDS2TJ124	120K
R573	ERDS2TJ561	560
R574	ERDS2TJ332	3.3K
R575	ERDS2TJ333	33K
R576	ERDS2TJ101	100
R577	ERDS2TJ563	56K
R578	ERDS2TJ103	10K
R579	ERDS2TJ101	100
R580	ERDS2TJ104	100K
R581	ERDS2TJ103	10K
R584	ERDS2TJ122	1.2K
R585	EROS2TKF3901	3.9K
R586	EROS2TKF2201	2.2K
R587	ERDS2TJ684	680K
R589	ERDS2TJ103	10K
R590	ERDS2TJ103	10K
R591	ERDS2TJ273	27K
R592	ERDS2TJ683	68K
R609	ERDS2TJ333	33K
R613 S △	ERD25FJ3R3	3.3
R614	ERDS2TJ333	33K
R615,616	ERDS2TJ273	27K
R631	ERDS2TJ471	470
R632	ERDS2TJ223	22K
R633	ERDS2TJ104	100K
R634	ERDS2TJ102	1K
R635	ERDS2TJ222	2.2K
R636	ERDS2TJ472	4.7K
R637,638	ERDS2TJ332	3.3K
R639,640	ERDS2TJ332	3.3K
R641	ERDS2TJ103	10K
R642	ERDS2TJ102	1K
R644	ERDS2TJ331	330
R651	ERDS2TJ391	390
R661	ERDS2TJ473	47K
R663,664	ERDS2TJ821	820
R665,666	ERDS2TJ152	1.5K
R671 S	ERD25FJ332	3.3K
R672 S	ERD25FJ151	150
R673 S	ERD25FJ681	680
R674 S	ERD25TJ223	22K
R675 S	ERD25TJ124	120K
R676 S	ERD25TJ153	15K
R677 S	ERD25FJ103	10K
R801,802	EROS2TKG7501	7.5K
R803,804	EROS2TKG4301	4.3K
R805,806	ERDS2TJ474	470K
R807,808	EROS2TKG3300	330
R809,810	ERDS2TJ473	47K
R811,812	ERDS2TJ473	47K
R821,822	ERDS2TJ223	22K
R851	ERDS2TJ183	18K
R852	ERDS2TJ102	1K
R853	ERDS2TJ682	6.8K
R854,855	ERDS2TJ472	4.7K
R857	ERDS2TJ102	1K
R858	ERDS2TJ471	470

Ref No	Part No.	Value
R859	ERDS2TJ822	8.2K
R861	ERO25TKG2401	2.4K
R862	ERO25TKG4701	4.7K
R863,864	ERDS2TJ472	4.7K
R865	ERDS2TJ682	6.8K
R867,868	ERDS2TJ183	18K
R871	ERO25TKG2401	2.4K
R872	ERO25TKG4701	4.7K
R873	ERDS2TJ682	6.8K
R881,882	ERDS2TJ472	4.7K
R883,884	ERDS2TJ123	12K
R885,886	ERDS2TJ123	12K
R887,888	ERDS2TJ472	4.7K
R889,890	ERDS2TJ472	4.7K
R891,892	ERDS2TJ820	82
R893,894	ERDS2TJ820	82
R1001	ERDS2TJ332	3.3K
R1002	ERDS2TJ223	22K
R1003	ERDS2TJ470	47
R1004,1005	ERDS2TJ1R8	1.8
R1006	ERDS2TJ332	3.3K
R1007	ERDS2TJ101	100
R1101	ERD10TLJ154	150K
R1102	ERD10TLJ221	220
R1104	ERD10TLJ103	10K
R1105	ERD10TLJ681	680
R1106	ERD10TLJ151	150
R1107	ERD10TLJ681	680
R1108	ERD10TLJ272	2.7K
R1109	ERD10TLJ334	330K
R1110	ERD10TLJ330	33

CAPACITORS

Ref No	Part No.	Value
C1 △	ECKDKC103PF	0.01
C4,5 △	ECKDKC103PF	0.01
C15	ECEA1CSS472	4700
C16 S	ECEA1CU102	1000
C17,18 S	ECEA1VU102	1000
C19 S	ECEA50Z4R7	4.7
C20 S	ECEA1AU101	100
C23,24 S	ECEA1HU100	10
C25,26 S	ECEA1HU100	10
C27,28 S △	ECKD1H223PF	0.022
C29,30 S △	ECKD1H223PF	0.022
C31 S	ECEA1HU4R7	4.7
C81,82 S	ECKD1H103MD	0.01
C83,84 S	ECEA1VU102	1000
C85,86 S	ECEA1HU010	1
C87,88 S	ECEA1EU101	100
C89 S	ECEA1AU470	47
C90,91 S	ECEA1EU470	47
C92,93 S	ECEA1AU101	100
C102 S	ECKD1H473ZF	0.047
C103	ECEA1CK100	10
C111 S	ECKD1H681KB	680P
C112 S	ECKD1H331KB	330P
C113,114	ECEA1HK2R2	2.2
C115 S △	ECEA1CN100S	10
C116 S	ECKD1H103ZF	0.01
C117 S	ECEA50Z3R3	3.3
C118 S	ECKD1H102KB	0.001
C119 S	ECKD1H104ZF	0.1
C120	ECEA1CK220	22
C121	ECQM1H223KV	0.022
C123,124 S	ECKD1H102KB	0.001
C125 S	ECCD1H101K	100P
C126	ECQM1H562KV	0.0056
C127	ECQM1H223KV	0.022
C129	ECEA0JK330	33
C130 S	ECKD1H473ZF	0.047
C131	ECEA0JK330	33
C132 S	ECKD1H473ZF	0.047
C133	ECQM1H102KV	0.001
C134	ECCD1H681K	680P
C135 S	ECKD1H104ZF	0.1
C201	ECQM1H104KV	0.1
C202 S △	ECEA1HN010S	1
C203 S	ECCD1H221K	220P
C204 S	ECKD1H103MD	0.01
C205,206	ECQM1H104KV	0.1

Ref No	Part No	Value
C207 S △	ECEA1HN010S	1
C208 S	ECCD1H181K	180P
C209 S	ECKD1H103MD	0.01
C210	ECQM1H823KV	0.082
C211,212 S	ECKD1H223PF	0.022
C213 S	ECKD1H223PF	0.022
C215 S	ECCD1H390K	39P
C216	ECQM1H153KV	0.015
C217 S	ECKD1H103MD	0.01
C218	ECQM1H333KV	0.033
C219 S	ECKD1H103MD	0.01
C220 S △	ECEA1CN100S	10
C221 S	ECKD1H471KB	470P
C222 S	ECKD1H103MD	0.01
C223	ECQM1H102KV	0.001
C224	ECQM1H103KV	0.01
C225 S	ECEA1HUR33	0.33
C226 S	ECKD1H222KB	0.0022
C227 S	ECKD1H103MD	0.01
C228,229 S	ECKD1H223PF	0.022
C231	ECQM1H472KV	0.0047
C233	ECCD1H680KS	68P
C234 S △	ECEA1HN010S	1
C301 S △	ECEA1CN100S	10
C302	ECQM1H104KV	0.1
C303	ECQM1H333KV	0.033
C304	ECQM1H102KV	0.001
C305	ECQM1H103KV	0.01
C306 △	ECEA0JN220	22
C307 S	ECEA1HU100	10
C308	ECCD1H100KS	10P
C401 S △	ECEA25N4R7	4.7
C402	ECQM1H682KV	0.0068
C403	ECQM1H272KV	0.0027
C404	ECQM1H333KV	0.033
C405 S	ECEA1HU100	10
C407	ECQM1H122KV	0.0012
C408 S	ECCD1H270KC	27P
C409	ECQM1H822KV	0.0082
C410 S	ECCD1H561K	560P
C411 S	ECKD1H103MD	0.01
C413 S	ECCD1H150KU	15P
C415 S	ECKD1H103MD	0.01
C417,418	ECQM1H224KV	0.22
C419	ECQM1H822KV	0.0082
C431 S	ECQM1H122JZ	0.0012
C432	ECQM1H102KV	0.001
C433 S	ECKD1H103MD	0.01
C434 S	ECCD1H150KU	15P
C435 S	ECQM1H102JZ	0.001
C436	ECQK1153JZ	0.015
C437 S	ECKD1H103MD	0.01
C438,439 S	ECCD1H220KC	22P
C440 S	ECEA1AU101	100
C441	ECQM1H103KV	0.01
C442 S	ECCD1H330KC	33P
C443	ECQM1H102KV	0.001
C444 S	ECKD1H103MD	0.01
C445 S	ECEA1CU220	22
C446 S	ECEA1CU330	33
C447 S	ECEA1EU470	47
C448,449 S	ECEA1HU100	10
C450 S	ECEA1CU221	220
C451 S	ECEA1EU470	47
C452 S	ECEA1AU101	100
C453 S	ECEA1EU470	47
C455 S	ECEA1EU470	47
C501 S	ECEA1EU101	100
C502 S	ECEA1HUR22	0.22
C503,504 S △	ECEA25N4R7	4.7
C505	ECKD1H333ZF	0.033
C506 S	ECKD1H102KB	0.001
C551 S	ECKD1H331KB	330P
C552	ECQM1H333KV	0.033
C553	ECQM1H392KV	0.0039
C554	ECKD1H473ZV	0.047
C555 S	ECEA50M2R2R	2.2
C556	ECQM1H124KV	0.12
C557 S	ECEA1HU010	1

Ref. No	Part No.	Value
C558	ECQM1H152KV	0.0015
C559	ECQM1H274KV	0.27
C561 S	ECEA50M2R2R	2.2
C562	ECQM1H392KV	0.0039
C563,564 S	ECEA50MR22R	0.22
C566 S △	ECEA1HNR47S	0.47
C567	ECQM1H184KV	0.18
C569	ECQM1H103KV	0.01
C570 S	ECEA1EU220	22
C571	ECCD1H181J	180P
C573 S	ECEA1HU100	10
C574	ECQM1H224KV	0.22
C575 S	ECEA1HU100	10
C576	ECQM1H332KV	0.0033
C577 S △	ECEA1CN100S	10
C603,604	ECKD1H473ZV	0.047
C610 S	ECKD1H102KB	0.001
C631 S	ECKD1H102KB	0.001
C633 S	ECEA1HU010	1
C634,635 S	ECEA1AU470	47
C636,637 S	ECEA1AU470	47
C638	ECEA1HU4R7	4.7
C661 S	ECKD1H101KB	100P
C663 S	ECEA1EU470	47
C671	ECKD1H103ZF	0.01
C801 S	ECEA1EU470	47
C802 S	ECKD1H150K	15P
C803,804	ECCD1H471J	470P
C805,806	ECQP1103GZ	0.01
C807,808 S △	ECEA1CN101S	100
C809,810 S	ECQM1H332JZ	0.0033
C820,821 S	ECKD1H103MD	0.01
C861,862	ECQP1102GZ	0.001
C871	ECQP1102GZ	0.001
C873,874	ECKD1H104ZF	0.1
C881,882 S	ECEA1EU470	47
C883	ECKD1H104ZF	0.1
C884,885	ECKD1H472ZV	0.0047
C1001	ECKF1H471KB	470P
C1002	ECKF1H121KB	120P
C1003	ECSF0GE107	100
C1101 S	ECKD1H681KB	680P
C1102,1103 S	ECQM1H223JZ	0.022
C1104	ECEA1CK100	10
C1105	ECQM1H102KV	0.001
C1106 S	ECEA50ZR33	0.33
C1107	ECQP1392JZ	0.0039
C1108	ECEA1HKR22	0.22
C1109	ECEA1HK2R2	2.2
C1110	ECEA1CK330	33

REPLACEMENT PARTS LIST (Electric Parts)

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
3. The Ⓢ mark is service standard parts and may differ from production parts.
4. The parenthesized numbers in the column of description stand for the quantity per set.
5. Bracketed indications in Ref. No. columns specify the areas. Parts without these indications can be used for all areas.

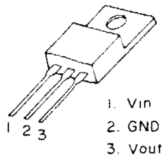
Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN7805	Regulator
IC2,4,5,81	AN78M15	Regulator
IC3,82	AN79M15	Regulator
IC101	AN7677S	Focus Servo Control
IC102	AN7678S	Tracking Servo Control
IC103	AN6556S	Focus and Tracking Error Amplifier
IC104	AN1358S	Laser Power Control
IC105	AN78L05	Regulator
IC106	AN79N05	Regulator
IC201,251	AN6554NS	Focus and Tracking Error Amplifier
IC202,402,415	AN6552F	Operational Amplifier
IC204,209	MN4011BS	NAND Gate
IC205,253	MN4053BS	Analog Switch
IC207	MN4001BS	NOR Gate
IC208,552	SVITL082CP	Operational Amplifier
IC255	MN4030BS	Exclusive OR Gate
IC301,554	AN6912S	Comparator
IC401,413	SVITC40H004P	Waveform Shaping
IC403	SVIUPD4053BC	Analog Switch
IC404	MN4066B	Analog Switch
IC405	DN74LS123	Monostable Multivibrator
IC406	SVITC40H386P	Exclusive OR Gate
IC407	DN74LS107	JK Flip Flop
IC408,414,416	DN74LS74AN	D Flip Flop
IC409,411	SVISN74LS628	Voltage Controlled Oscillator
IC410	AN78M05	Regulator
IC412	SVITC40H000P	NAND Gate
IC417	SVISN74LS393	Monostable Multivibrator
IC418	AN6682	Pitch Control
IC419	SVITC40H386P	Exclusive OR Gate
IC501	AN6637	Spindle Motor Drive
IC551	AN7679S	CLV Control
IC553	MN4066BS	Analog Switch
IC604	SVIBA6209	Loading Motor Drive
IC611	MN1421PCM	Remote Control Decoder
IC612	MN1564PCL	Operation Control
IC613	SVIM53207P	Buffer
IC614	DN74LS04	Inverter
IC615,702	MN2114-2	Random Access Memory
IC651	MN1430PCG	Display Drive
IC701	MN6614	EFM Demodulator
IC703	MN6616	Error Correction
IC704	MN4216-20	Random Access Memory
IC705	MN6615	CIRC Control
IC801	AN6806	D/A Converter
IC802,803,804,807	SVILM833NA	Operational Amplifier
IC805,806	SVIUPD4053BC	Analog Switch
IC881,882	SVINJM4556S	Operational Amplifier
IC1001	MN6030B	Remote Control Signal Processing
IC1101	AN5020	Remote Control Signal Amplifier

Ref. No	Part No.	Description
TRANSISTORS		
Q81,403,601,671 672	2SD636	Regulator and Switching
Q82,401,402,611 612	2SB641	Relay Drive,CLV Control and Switching
Q101	2SD638	Laser Power Control
Q201,205	2SD1266-P	Actuator Drive and Traverse Motor Drive
Q202,206	2SB941	Actuator Drive and Traverse Motor Drive
Q203	2SD1252	Actuator Drive
Q204	2SB929	Actuator Drive
Q207,302,303,304 305,306,602 Ⓢ	2SC828AR	Switching and Dropout Detector
Q301 Ⓢ	2SA722-S	Dropout Detector
Q404,551 Ⓢ	2SC1047-C	RF Amplifier and CLV Control
Q552 Ⓢ	2SC1328-T	CLV Control
Q1001,1003,1101	2SD636	Remote Signal Amplifier and OSC
Q1002	2SD638	Remote Signal Amplifier
DIODES		
D1 ⚠	SVDS2VB20	Rectifier
D2,81 ⚠	SVDS1WB40	Rectifier
D82,84,304,404,554 609	MA4056	Zener,5.6V
D83,101,201～206 302,303,401～402 405,551,631～635	MA165	Switching
D85	MA4100	Zener,10V
D86	MA1091	Zener,9.1V
D636	MA4120	Zener,12V
D651,652,655	LN28RCPP	LED,Music Scan,Repeat and Pitch
D653	LN48YCP	LED,Pause/Stop
D654	LN38GCPP	LED,Play
D661	SVDPR5553KF	LED,Sensor
D1001,1003	MA154WK	Switching
D1005,1006	MA154WA	Switching
D1007,1008	LN66	LED(Transmitter)
D1009	LN26RP	LED(Remote Control)
D1101	PH302	Phote Diode
D1102	MA165	Switching
VARIABLE RESISTORS		
VR102,106,107	EVN32CA00B14	Focus gain, Tracking Offset and Focus Offset Adj.,10kΩ(B)
VR103,104,105	EVN32CA00B53	Focus Balance Tracking Balance and Tracking Gain Adj.,5kΩ B
VR201	EVN38CA00B53	Traverse Offset Adj.,5kΩ(B)
VR401	EVN38CA00B13	11T Speed Adj., 1kΩ(B)
VR402,403	EVN38CA00B53	Reference frequency Adj.,5kΩ(B)
VR651	EWANF0X05A24	Pitch Control
VR801	EWCSNAF15AF5	Phones Level,100kΩ(A)
VR851	EVM38GA00B24	MSB Adj.,20kΩ(B)
R1103	EVNJ0AA00B13	Sensor OSC Adj.,1kΩ(B)
COMPONENT COMBINATIONS		
R643	EXBP88223K	22kΩ×8
R667～669	EXBP88104K	100kΩ×8

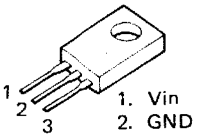
Ref. No	Part No.	Description
COMPONENT COMBINATIONS		
R670	EXBP86472K	4.7kΩ×6
C11～14,17,18 ⚠	EXRFS203ZS	0.01μF×2
CRYSTAL		
X401	SVQNR8643	8.643MHz
CERAMIC OSCILLATOR		
X1001	CSB420PB1	420kHZ
SWITCHES		
S1 ⚠	ESB823V	Power
S2 ⚠	SRDSHXW0251	Voltage Selector
S603,608	SRDSBSW97-2	Close and Open
S604,605	SRDSBSW-180	Rest and End
S607	SRDSMLS-1	Close
S651	SRDSHSW0963	Auto Pause/Timer Selector
S652	ESB6471	Pitch
S653～675	EVQQS405K	Operation Keys
LOW PASS FILTER		
LPF801,802	SVIAL012	Filter
RELAY		
RLY801	SFDYG5A237P	Muting
FLUORESCENT DISPLAY TUBE		
FL601	SRDQBG191Z	Display
THERMISTER		
TH1101	ERTD2ZHK104S	100kΩ
HALL ELEMENTS		
H501,502	OH-001	Spindle Motor Position Detecting
COILS		
L1 ⚠	UF1922C102Y	Line Filter
T1101	ELM-7Q206A	OSC
POWER TRANSFORMER		
T1 ⚠	SLT68PE7E	Power Source
FUSES		
F1 ⚠	XBA2C04TR0	250V,T400mA
F2 ⚠	XBA2C02TR0	250V,T200mA

• Terminal guide of transistors, and IC's

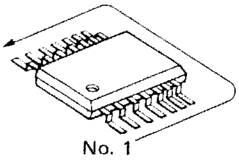
AN7805, AN78M15
AN79M15, AN78M05



AN79N05'

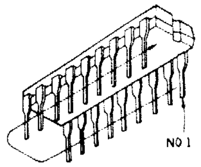


AN7677S AN7679S	28 Pin
AN7678S	22 Pin
AN6556S AN6552S AN1358S	8 Pin
AN6554NS MN4030BS AN6912S MN4066BS MN4001BS DN74LS74AS MN4011BS	14 Pin
MN4053BS DN74LS123S	16 Pin

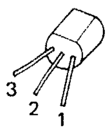


DN74LS04 SVIM53207P SVISN74LS628 SVITC40H004 SVITC40H386	14 Pin
SVITL082CP SVILM833NA AN6552	8 Pin
MN1544PCH MN1430PCG	40 Pin
MN6614 MN6616	42 Pin
MN2114-2	18 Pin
MN4216-20	24 Pin
DN74LS123	16 Pin
MN6030	22 Pin

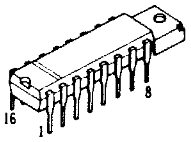
SVIUPD4053BC	16 Pin
MN1421PCM AN6806	28 Pin
MN1564PCL MN6615	64 Pin
MN4066B SVITC40H000 DN74LS74A DN74LS107	14 Pin



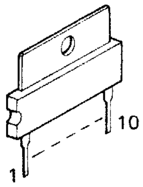
AN78L05



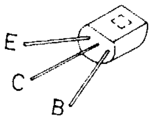
AN6637



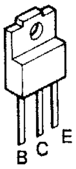
SVIBA6209



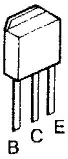
2SC828, 2SA564
2SC1328, 2SC1047



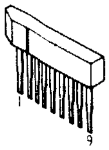
2SD1266, 2SB941



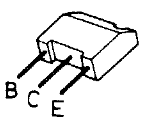
2SD1252, 2SB929



AN6682,
SVINJM4556S

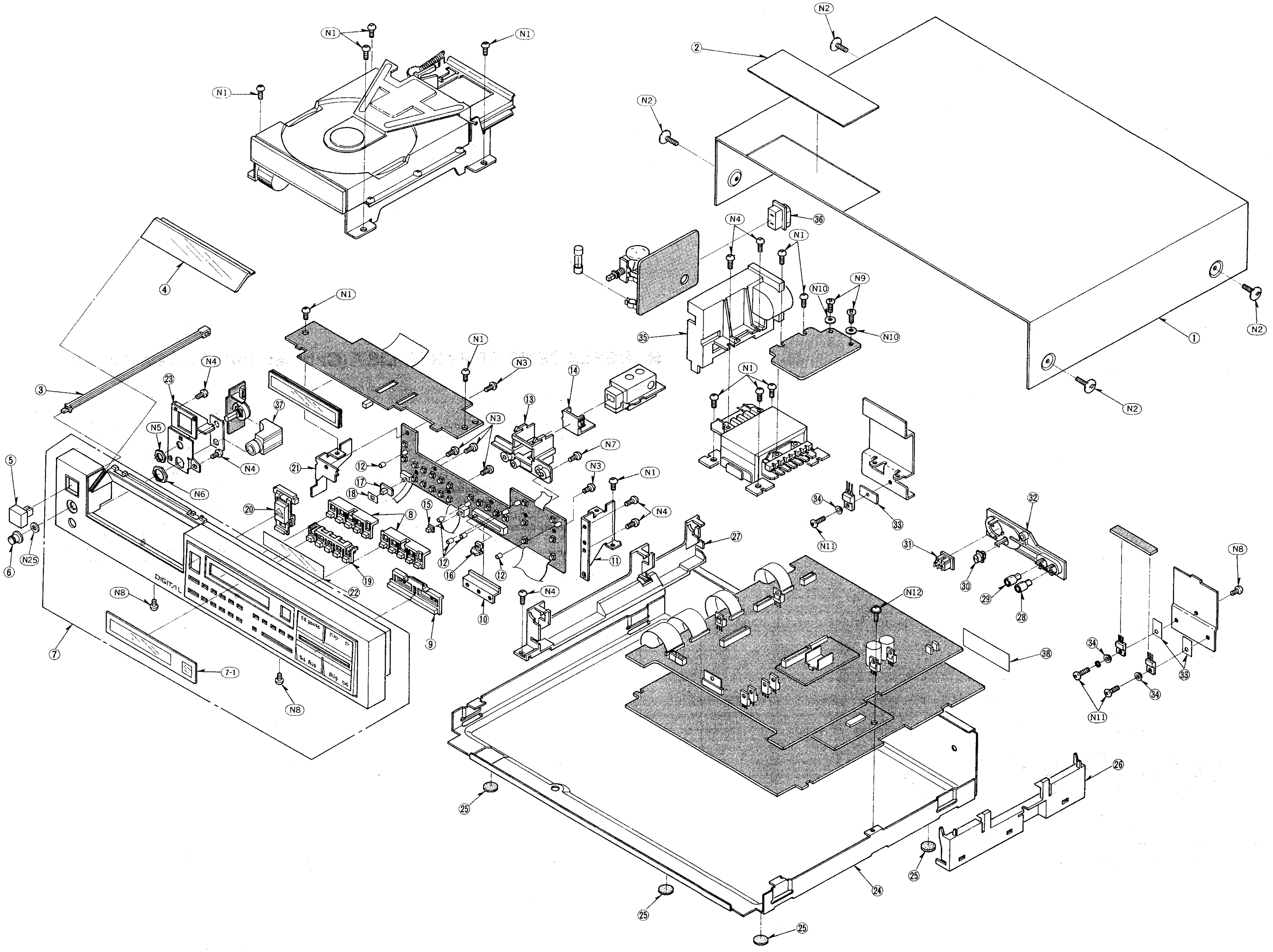


2SD638, 2SB641



■ EXPLODED VIEWS

- Cabinet and chassis parts


N1
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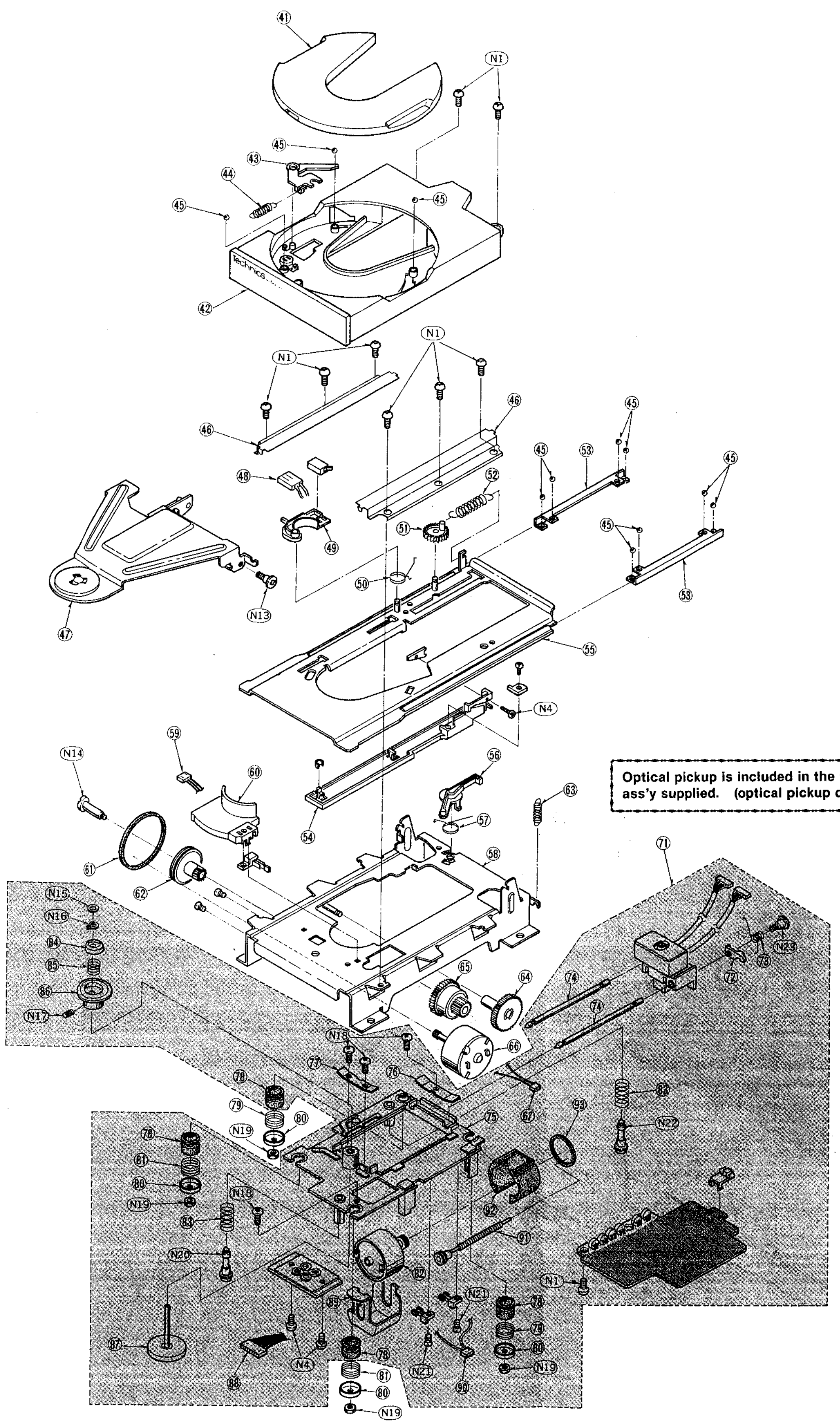
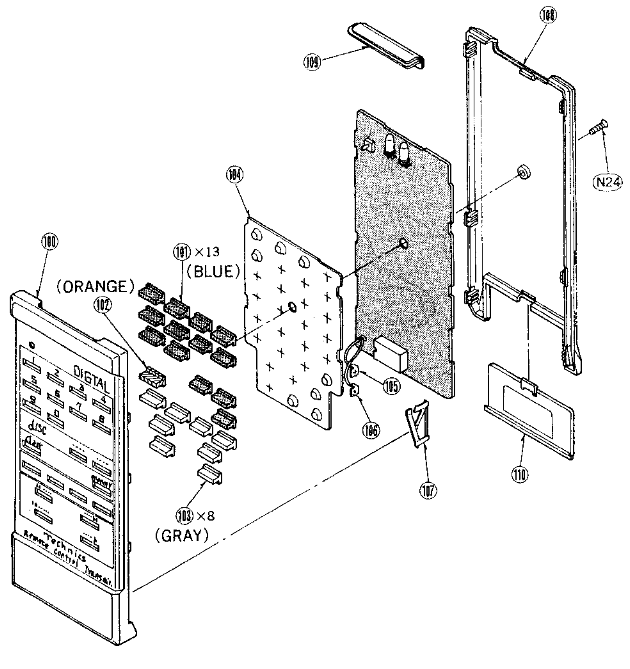
- **Loading drive mechanism and optical deck unit parts**



Optical pickup is included in the traverse unit ass'y supplied. (optical pickup deck unit)

- **Remote control unit parts**



■ REPLACEMENT PARTS LIST (Cabinet and Chassis Parts)

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "Ⓢ" mark is service standard parts and may differ from production parts.
5. Ⓚ -marked parts are used for black only, while ○-marked parts are for silver type only.
6. Parts other than Ⓚ -and ○-marked are used for both black and silver types.
7. The parenthesized numbers in the columns of description stand for the quantity per set.

Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EG] is available in F.R. Germany.
- * [EB] is available in Belgium.
- * [EH] is available in Holland.
- * [EF] is available in France.
- * [Ei] is available in Italy.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [PA] is available in far East PX.
- * [PE] is available in European Military.
- * [PC] is available in European Audio Club.

Black type model No.: SL-P8 (K)

Ref. No.	Part No.	Description
1 ○	SRAC008N04	Cabinet(Silver) (1)
1 Ⓚ	SRAC008N53	Cabinet(Black) (1)
2	SRKK008N02	Ornament,Cabinet (1)
3	SRUM007N10	Shaft,Power Switch (1)
4	SRKK007N01	Ornament,Front Panel (1)
5	SRKT008N10	Knob,Power (1)
6	SRKT008N08E	Knob,Head Phone (1)
7 ○	SRAC008N01R	Front Panel(Silver) (1)
7 Ⓚ	SRAC008N51R	Front Panel(Black) (1)
7-1	SRKK008N01	Ornament Plate (1)
8	SRKT008N01	Button,Program(A) (2)
9	SRKT007N02	Button,Search (1)
10	SRUM008N02	Base(Silver) (1)
10	SRUM008N51	Base(Black) (1)
11	SRUP008N02	Guide,Front Panel (1)
12	SRUM007N21	Holder,L,E,D (5)
13	SRUM008N01	Holder,Remote Control receiver (1)
14	UR37FT29	Filter,Remote Control receiver (1)
15	SRKT008N06	Knob,Pitch Control Selector (1)
16	SRKT008N04	Knob,Pitch Control (1)
17	SRKT008N05	Knob,Time (1)
18 [Black type only]	SRUZ008N01	Spacer (1)
19	SRKT008N02	Button,Program(B) (1)

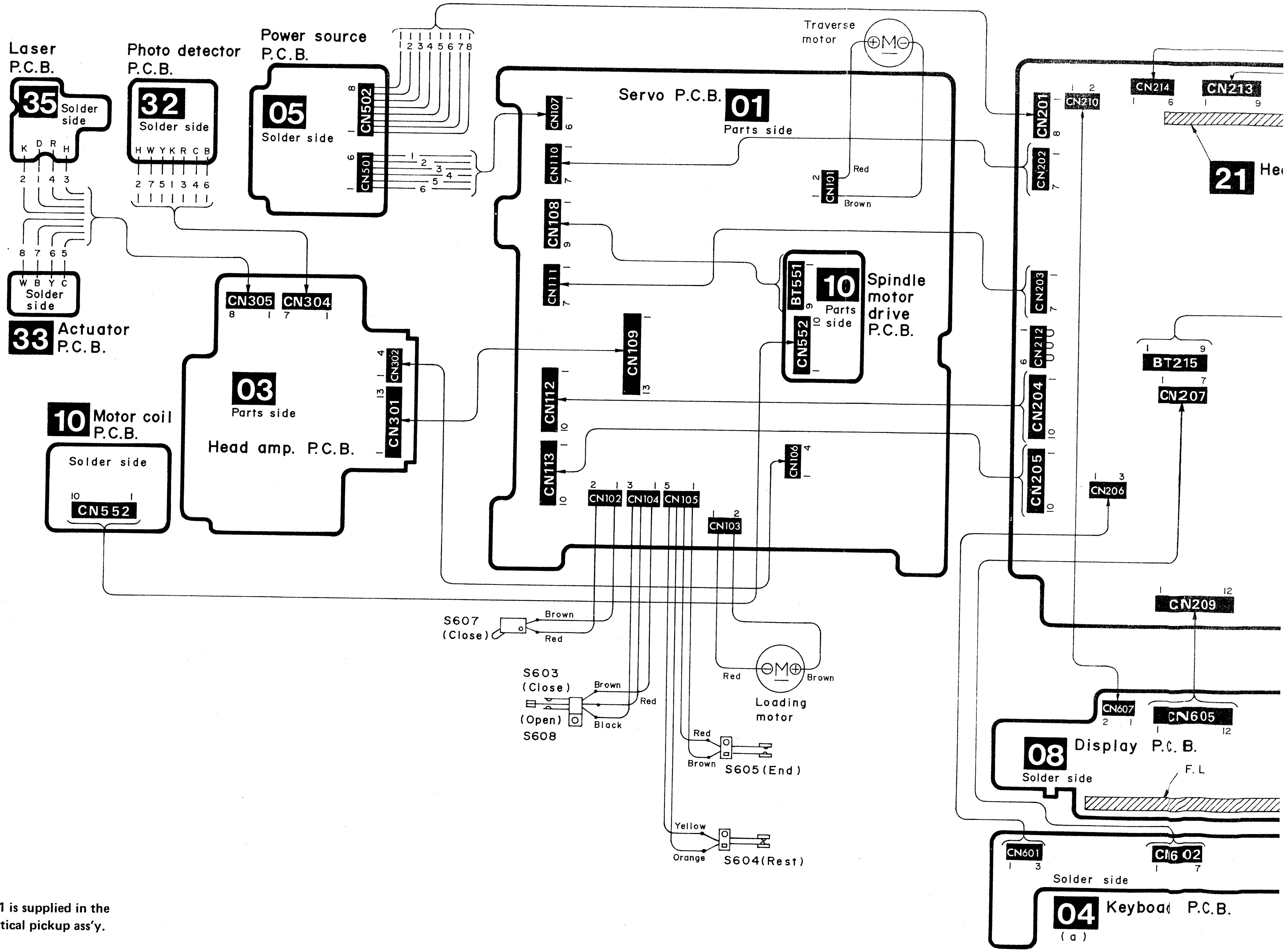
Ref. No.	Part No.	Description
20	SRKT008N03	Button,open/close (1)
21	SRUP008N03	Guide (1)
22	SRKK008N04	Front Panel (1)
23	SRUP008N01	Guide,Head Phone Terminal (1)
24	SRAC008N03	Rear Panel (1)
25	SRGA008N01	Foot,Set (4)
26	SRUM007N16	Guide,Right Side (1)
27	SRUM007N14	Guide,Left Side (1)
28	SRDJ007N05	Jack,(Red)Lineout (1)
29	SRDJ007N06	Jack,(White)Lineout (1)
30	SRDJ007N03	Jack,Synchro rec (1)
31	SRDJ007N04	Jack,External (1)
32	SRUM007N11	Guide,Jack (1)
33	SRDCC07-01	Insulation Plate,Regulator IC (3)
34	SRDBC07-01	Bushing,Regulator IC (3)
35	SRUM007N13	Holder,Power Printed Base (1)
36 [EK] ⚠	SFDJHSC0498	AC Socket (1)
36 [XL,XA PE,XM PA, PC] ⚠	SFDJHSC0509	AC Socket (1)
36 [Other Areas] ⚠	SFDJHSC0505	AC Socket (1)
37	SSDJ3317020	Jack,Head Phone (1)

Ref. No.	Part No.	Description
38 [E]	SRNN008S01	Name Plate (1)
38 [EK, XL]	SRNN008G01	Name Plate (1)
38 [XA, XM]	SRNN008X01	Name Plate (1)
38 [PA, PE]	SRNN008P01	Name Plate (1)
38 [PC]	SRNN008P02	Name Plate (1)
38 [Other Areas]	SRNN008R01	Name Plate (1)
LOADING DRIVE MECHANISM AND OPTICAL PICK-UP DECK UNIT PARTS		
41	SRUM007N05E	Disc Tray Ass'y (1)
42 ○	SRUM008N04R	Disc Holder Ass'y (Silver) (1)
42 Ⓚ	SRUM008N51R	Disc Holder Ass'y (Black) (1)
43	SRUM007N07	Cam,Disc Tray (1)
44	SRQH007N02	Spring,Disc Tray (1)
45	SFYB-5-32	Still Ball (3)
46	SRUP007N07	Bracket (2)
47	SRUP007N05A	Disc Clamp Plate (1)
48	SRDJ007N12E	Connector Ass'y 2P (1)
49	SRUM007N18	Cover,Switch (1)
50	SRQS007N02	Spring (1)
51	SRUG007N04	Gear,Return (1)
52	SRQH007N01	Spring (1)
53	SRUM007N15	Guide (1)
54	SRUM007N09	Rack,Drive (1)
55	SRUP007N10E	Loading Guide Ass'y (1)

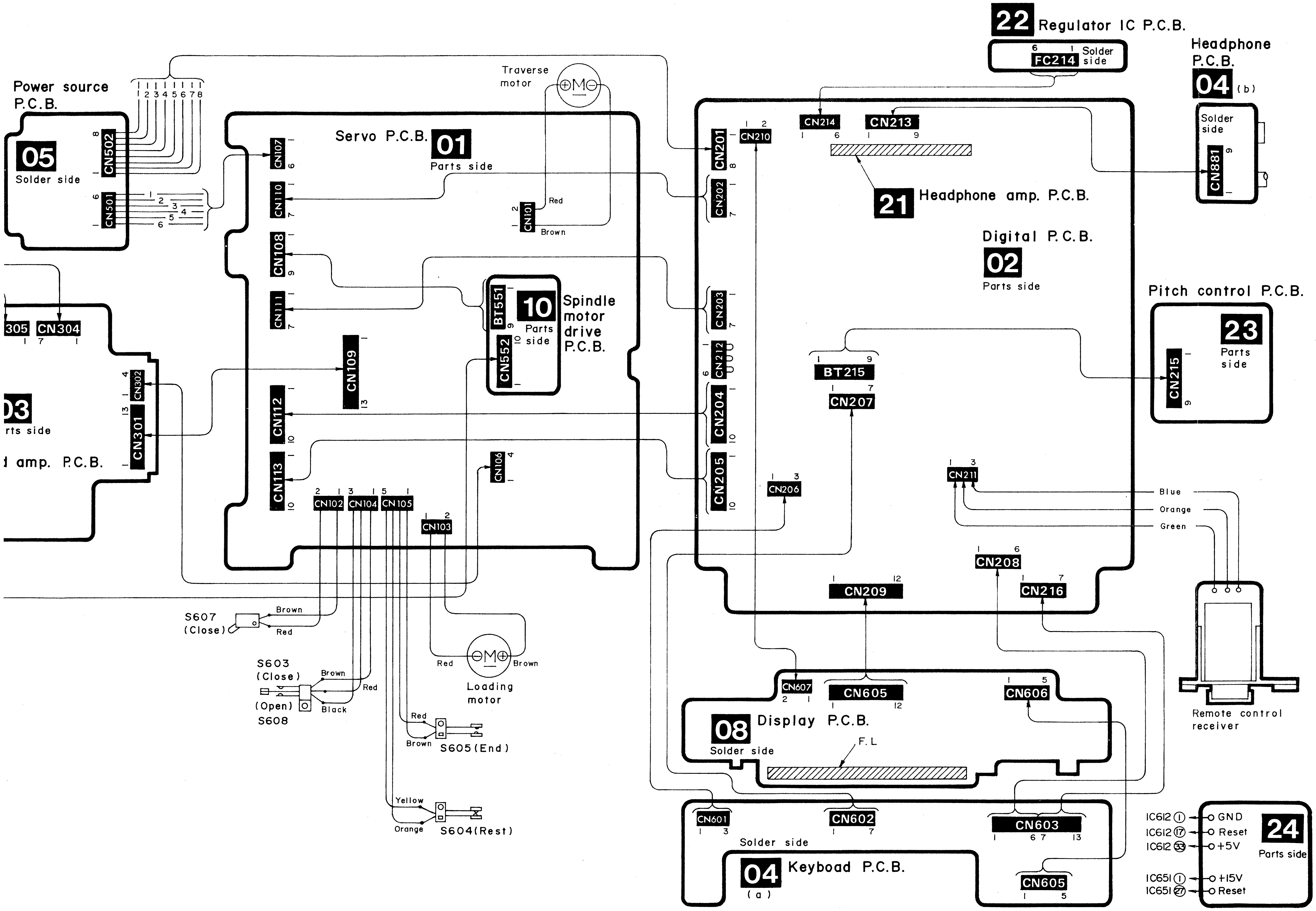
Ref. No.		Part No.	Description	
56		SRUM007N06	Lock Arm	(1)
57		SRQS007N03	Spring,Lock Arm	(1)
58		SRUP007N03R	Loading Base Ass'y	(1)
59		SRDJ007N13E	Connector Ass'y	(1)
60		SRUM007N17	Cover,Switch	(1)
61		SRGB007N02	Belt,Loading Motor	(1)
62		SRUG007N01	Pully,Gear	(1)
63		SRQH007N03	Spring,Clamp plate	(1)
64		SRUG007N02	Gear,Center	(1)
65		SRUG007N03	Gear Drive	(1)
66		SRMH007N01A	Motor,Loading Mechanism	
67		SRDJ007N10E	Connector Ass'y	(1)
OPTICAL PICK-UP DECK UNIT PARTS				
71		SRUK007N02R	Optical Pick-up Ass'y	(1)
72		SRUM007N22	Bracket,Optical Pick-up Ass'y	(1)
73		SRQS007N01	Spring,Bracket	(1)
74		SRXJ007N01	Shaft,Optical Pick-up Bracket	(2)
75		SRUK007N02E	Optical Deck Unit Base Ass'y	(1)
76		SRUP007N09	Bracket	(1)
77		SRXJ007N01	Bracket	(1)
78		SRGC007N02	Rubber Cushion	(4)
79		SRQA007N02	Spring,Insulator(A)	(2)
80		SRUP007N12	Holder,Spring	(4)
81		SRQA007N01	Spring,Insulator(B)	(2)
82		SRMH007N02A	Motor,Optical Pick-up Drive	(1)
83		SRQA007N03	Spring	(2)
84		SRTE007N02	Holder	(1)
85		SRQA010N04	Spring	(1)
86		SRTE007N01	Turntable Platter	(1)
87		SRTM007N01A	Magnet Ass'y	(1)
88		SRDJ007N03E	Connector Ass'y 8P	(1)
89		SRUM007N19	Holder,Motor	(1)
90		SRDJ007N14E	Connector Ass'y	(1)
91		SRXG007N01E	Pully Screw	(1)
92		SRGC007N01	Rubber Cushion,Motor	(1)
93		SRGB007N03	Belt	(1)
REMOTE CONTROL PARTS				
100	○	UR51VCS95	Case,Cover(Silver)	(1)
100	Ⓚ	UR51VCS101	Case,Cover(Black)	(1)
101		UR51BT5B	Button,(Blue)	(13)
102		UR51BT5F	Button,(Orange)	(1)
103		UR51BT5	Button,(Grey)	(8)
104		UR51CT11D	Rubber,Point	(1)
105		URC180TD8	Battery Terminal⊕	(1)
106		URC180TD9	Battery Terminal⊖	(1)
107		URC180TD10A	Battery Terminal	(1)
108	○	UR51VCS100	Case,Bottom(Silver)	(1)
108	Ⓚ	UR51VCS102	Case,Bottom(Black)	(1)
109		UR51SB4	Cover	(1)
110	○	UR51VEC99	Battery Cover(Silver)	(1)
110	Ⓚ	UR51VEC103	Battery Cover(Black)	(1)
SCREWS,NUTS AND WASHERS				
N1	Ⓢ	XTV3+6BFN	Screw,⊕3×6	(16)
N2	○	SNE2095-2	Screw,(Silver)	(4)
N2	Ⓚ	SNE2095-3	Screw,(Black)	(4)
N3	Ⓢ	XTV3+10BFN	Screw,⊕3×10	(2)
N4	Ⓢ	XTV3+8BFN	Screw,⊕3×8	(8)
N5		XNSS8	NUT, φ 8	(1)
N6		XNSS12	NUT, φ 12	(1)
N7	Ⓢ	XTV3+14BFN	Screw,⊕3×14	(2)
N8	Ⓢ	XTV3+8BFZ	Screw,⊕3×8	(2)
N9	Ⓢ	XTN3+6B	Screw,⊕3×6	(2)
N10	Ⓢ	XWE3	Washer, φ 3	(2)
N11		XYN3+C8S	Screw,⊕3×8	(3)
N12		XTW3+8Q	Screw,⊕3×8	(1)
N13		SFXGV05N03	Screw	(1)
N14		SRXG007N04	Screw	(1)
N15		SRXW007N03	Washer	(1)
N16		GTW-3	Washer	(1)
N17		XXE26D5FZ	Screw	(1)
N18	Ⓢ	XTN3+6B	Screw,⊕3×6	(4)
N19	Ⓢ	XNG26EBW	Nut, φ 2,6	(4)
N20		SRXG007N07	Screw	(1)
N21	Ⓢ	XTN2+6B	Screw,⊕2×6	(1)
N22		SRXG007N06	Screw	(1)
N23		SRXG007N02	Screw	(1)
N24	Ⓢ	XSS26+10BN	Screw,⊕2.6×10	(1)

Note: Ref. No. 71 is supplied in the from of optical pickup ass'y.

■ PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

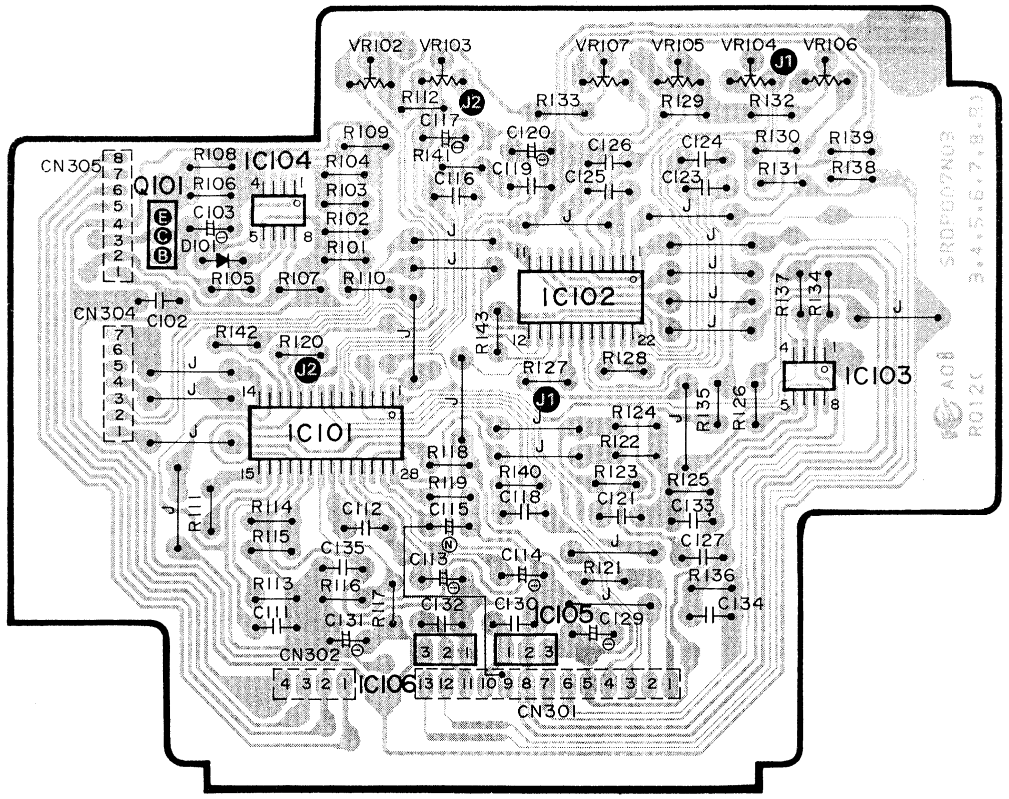

Laser P.C.B.
35 Solder side
K D R H
2 1 4 3
8 7 6 5
W B Y C
Solder side
33 Actuator P.C.B.
Photo detector P.C.B.
32 Solder side
H W Y K R C B
2 7 5 1 3 4 6
Power source P.C.B.
05 Solder side
CN502
CN501
1 2 3 4 5 6 7 8
CN305
CN304
03 Parts side
Head amp. P.C.B.
CN302
CN301
10 Motor coil P.C.B.
Solder side
CN552
Servo P.C.B. 01 Parts side
CN107
CN110
CN108
CN111
CN109
CN112
CN113
CN101
Red
Brown
Traverse motor
10 Spindle motor drive P.C.B.
Parts side
BT551
CN552
CN106
CN102
CN104
CN105
CN103
S607 (Close)
Brown
Red
S603 (Close)
(Open) S608
Brown
Red
Black
Loading motor
Red
Brown
S605(End)
Yellow
Orange
S604(Rest)
CN201
CN210
CN202
CN203
CN212
CN204
CN205
CN214
CN213
21 He
BT215
CN207
CN206
CN209
CN607
CN605
08 Display P.C.B.
Solder side
F.L
CN601
CN6 02
Solder side
04 Keyboa P.C.B.
(a)

ARD AND DIAGRAM

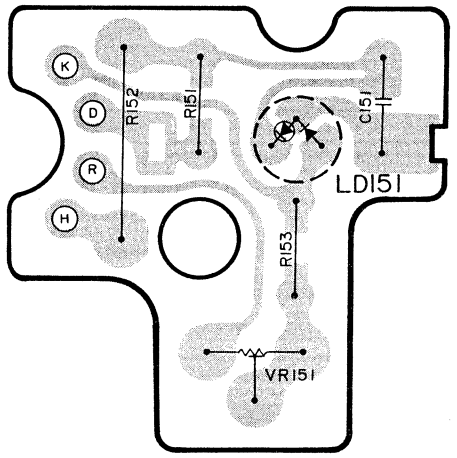

22 Regulator IC P.C.B.
FC214 Solder side
Headphone P.C.B.
04 (b)
Solder side
CN881
Power source P.C.B.
05 Solder side
CN502
CN501
Traverse motor
Servo P.C.B. 01 Parts side
CN107
CN110
CN101
Red
Brown
CN108
CN111
CN109
BT551
CN552
10 Spindle motor drive P.C.B.
Parts side
CN112
CN113
CN106
CN102
CN104
CN105
CN103
CN201
CN210
CN214
CN213
21 Headphone amp. P.C.B.
Digital P.C.B.
02 Parts side
CN202
CN203
CN212
CN204
CN205
BT215
CN207
CN206
CN211
CN208
CN209
CN216
Pitch control P.C.B.
23 Parts side
CN215
Blue
Orange
Green
Remote control receiver
CN305
CN304
03
CN302
CN301
rts side
amp. P.C.B.
S607 (Close)
Brown
Red
S603 (Close)
(Open) S608
Black
Loading motor
Red
Brown
S605 (End)
Yellow
Orange
S604 (Rest)
CN607
CN605
CN606
08 Display P.C.B.
Solder side
F.L
CN601
CN602
CN603
Solder side
04 Keyboad P.C.B.
(a)
CN605
IC612 ① GND
IC612 ⑰ Reset
IC612 ㉝ +5V
IC651 ① +15V
IC651 ㉗ Reset
24 Parts side

■ PRINTED CIRCUIT BOARDS

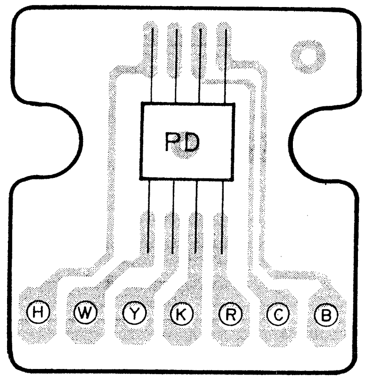
03 (Head amplifier P.C.B.)


VR102
VR103
VR107
VR105
VR104
VR106
J1
J2
R133
R129
R132
R112
C117
R141
C120
C126
C124
R130
R139
R131
R138
C119
C125
C123
C116
CN305
R108
IC104
R104
R109
Q101
R106
R103
C103
R102
D101
R101
R105
R107
R110
IC102
R137
R134
CN304
C102
R142
R120
R143
R127
R128
IC103
IC101
R124
R135
R126
R122
R118
R140
R123
R125
R119
C118
C121
C133
R111
R114
C112
C115
C127
R115
C135
C113
C114
R121
R136
R113
R116
R117
C111
C131
C132
C130
IC105
C129
C134
CN302
IC106
CN301

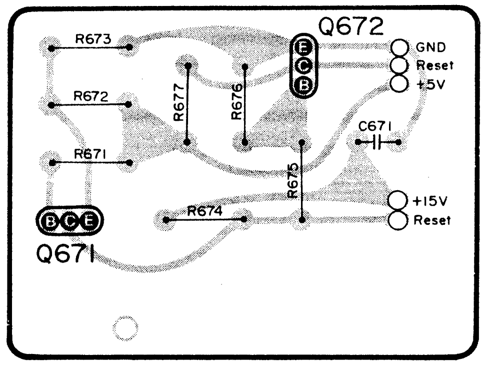
35 (Laser P.C.B.)


K
D
R
H
R152
R151
C151
LD151
R153
VR151

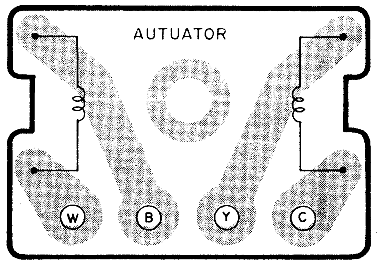
32 (Photo detector P.C.B.)



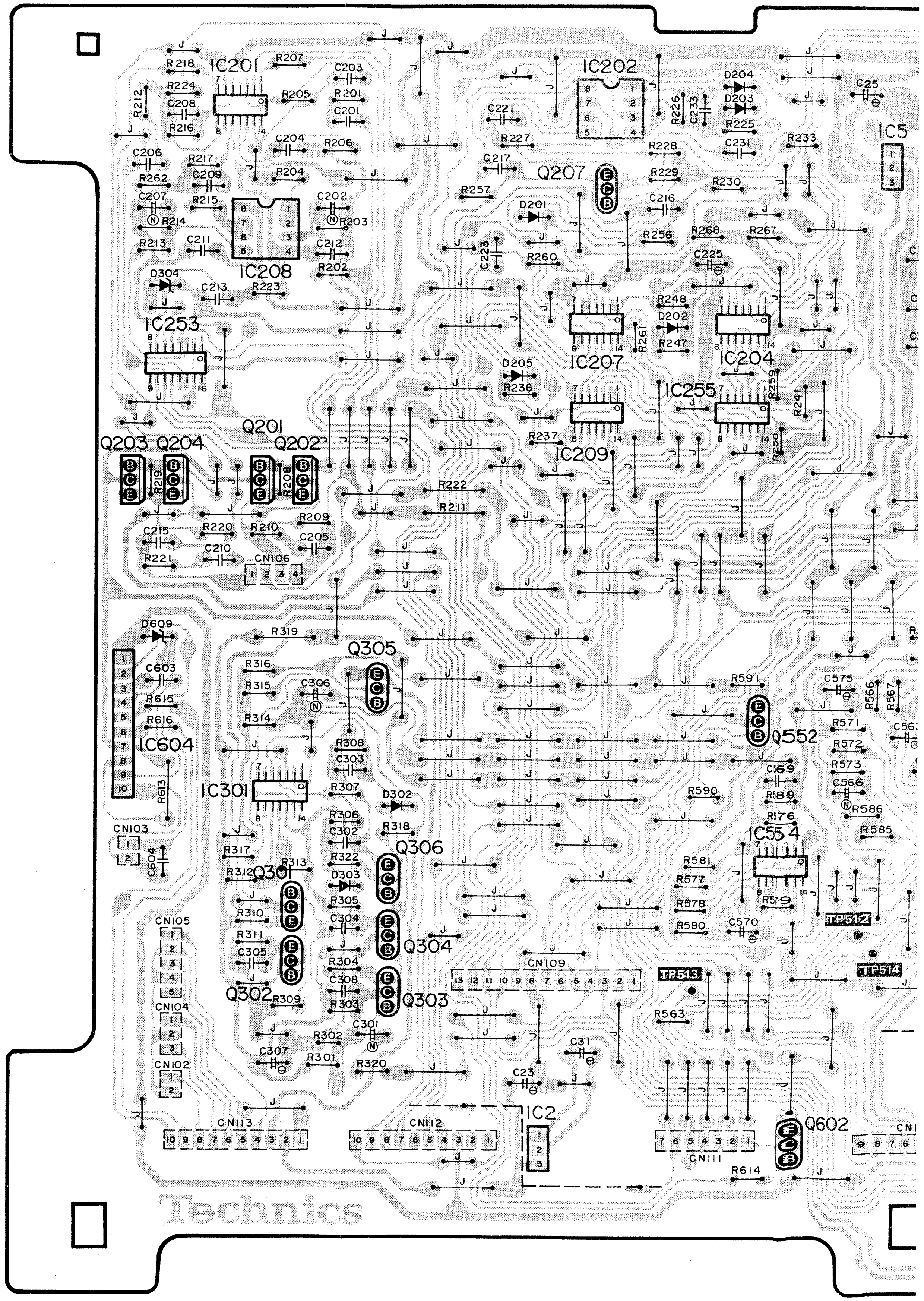
24 (Reset P.C.B.)


R673
Q672
GND
Reset
+5V
R672
R677
R676
R671
C671
R675
R674
+15V
Reset
Q671

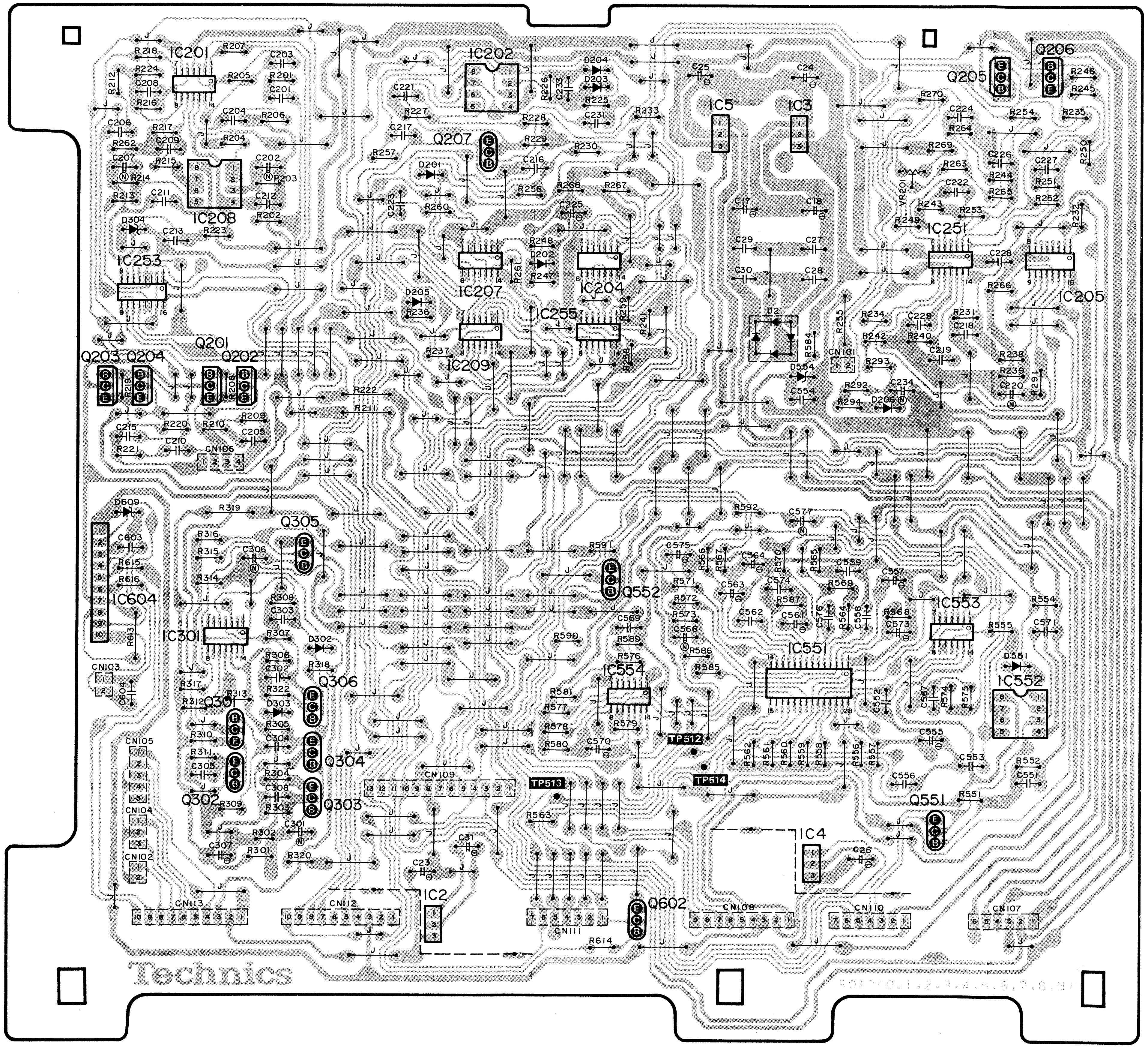
33 (Actuator coil P.C.B.)


AUTUATOR
W
B
Y
C

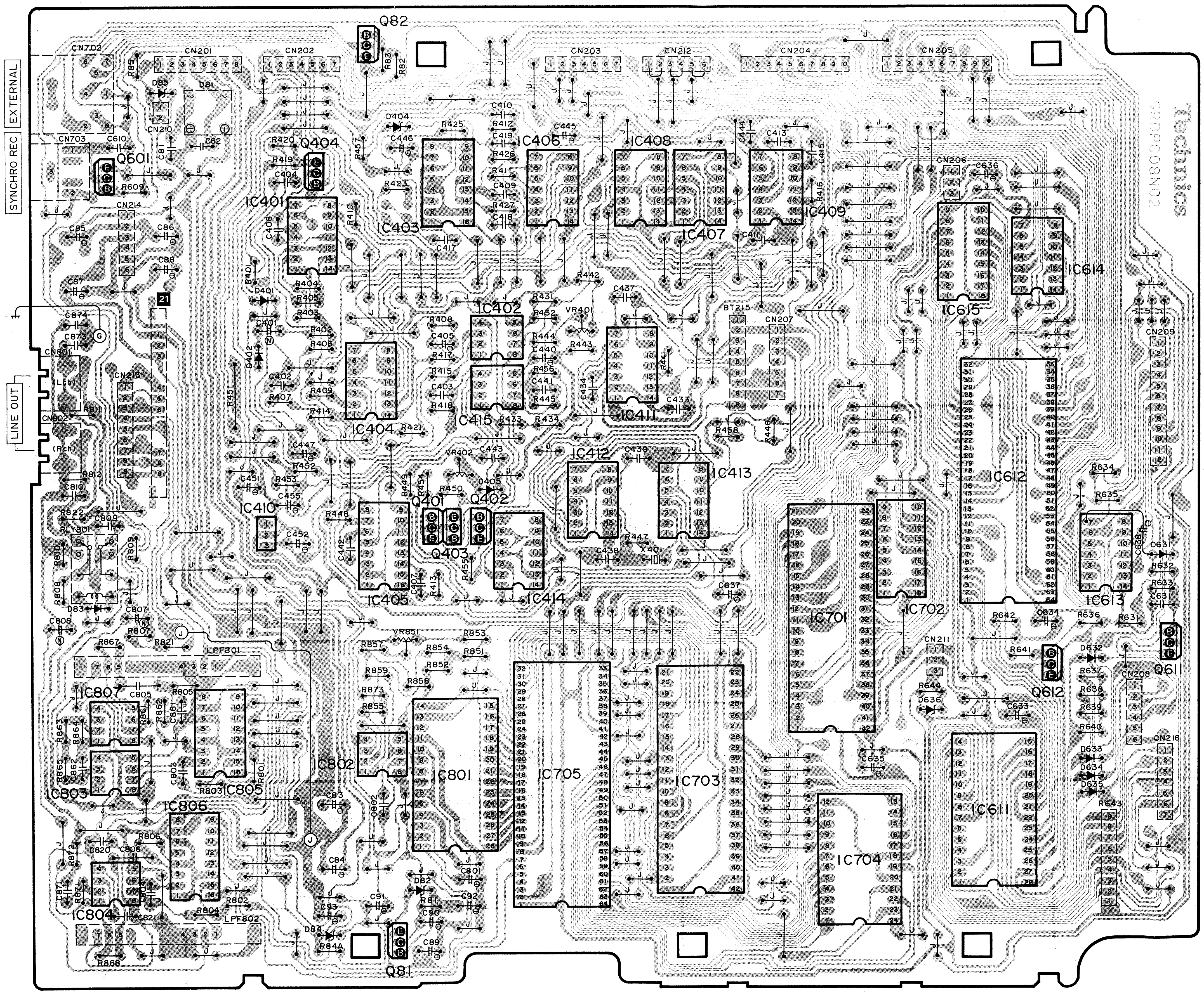
01 (Servo P.C.B.)


IC201
IC202
R218
R207
C203
D204
R212
R224
R205
R201
D203
C25
C208
C201
C221
R226
C233
R216
R225
IC5
C206
R217
C204
R206
R227
R228
C231
R233
R262
C209
R204
C217
Q207
R229
R230
C207
R215
C202
R257
D201
C216
R214
R203
R213
C211
C212
C223
R256
R268
R267
IC208
R202
R260
C225
D304
C213
R223
R248
IC253
D202
R261
R247
IC207
IC204
D205
R236
IC255
R239
R241
Q201
Q203
Q204
Q202
R219
R208
R237
IC209
R222
R211
R209
C215
R220
R210
C205
R221
C210
CN106
D609
R319
Q305
C603
R316
R591
C575
R566
R567
R615
R315
C306
Q552
R616
R314
R571
C56
IC604
R308
C303
R572
R573
C566
IC301
R307
D302
R590
R586
R613
R306
R318
R176
R585
CN103
R317
C302
Q306
IC554
C604
R312
Q301
R313
R322
R581
R577
D303
R305
R578
TP512
R310
C304
R580
C570
CN105
R311
Q304
C305
R304
CN109
TP513
TP514
C308
Q303
CN104
Q302
R309
R303
R563
C301
R302
C31
CN102
C307
R301
R320
C23
IC2
Q602
CN113
CN112
CN111
R614
Technics

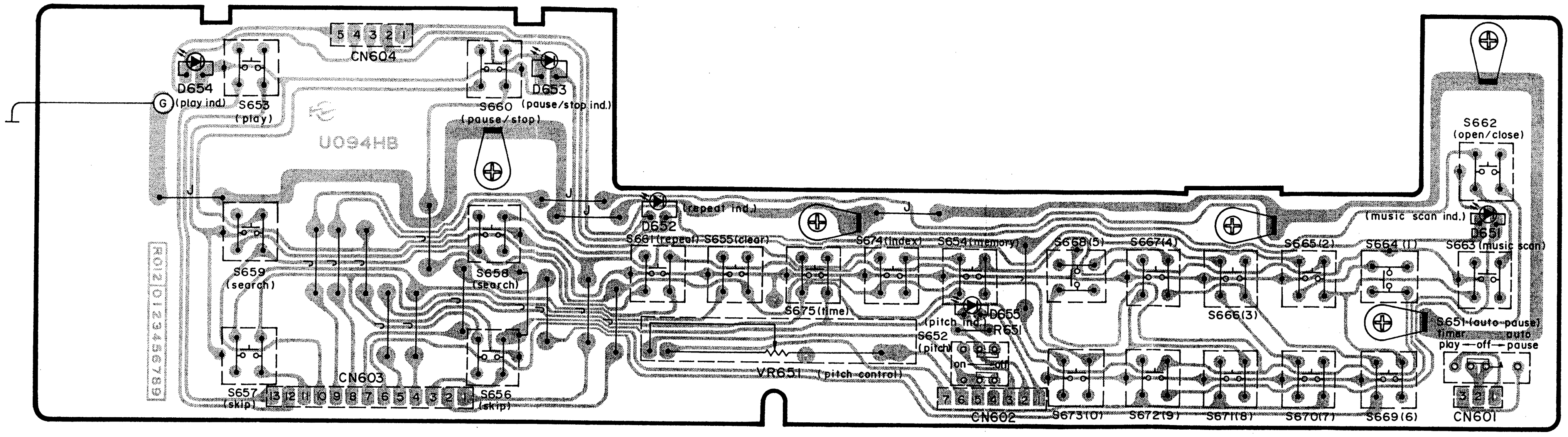
01 (Servo P.C.B.)


IC201
IC202
IC208
IC253
IC207
IC204
IC209
IC255
IC5
IC3
IC251
IC205
Q205
Q206
Q207
Q201
Q202
Q203
Q204
D2
D201
D202
D203
D204
D205
D206
D304
D554
CN101
CN106
D609
IC604
Q305
IC301
Q301
Q302
Q303
Q304
Q306
D302
D303
CN103
CN105
CN104
CN102
CN113
CN112
IC2
CN109
TP513
CN111
Q602
R614
CN108
Q552
IC554
TP512
TP514
IC551
IC553
IC552
D551
Q551
IC4
CN110
CN107
VR201
Technics

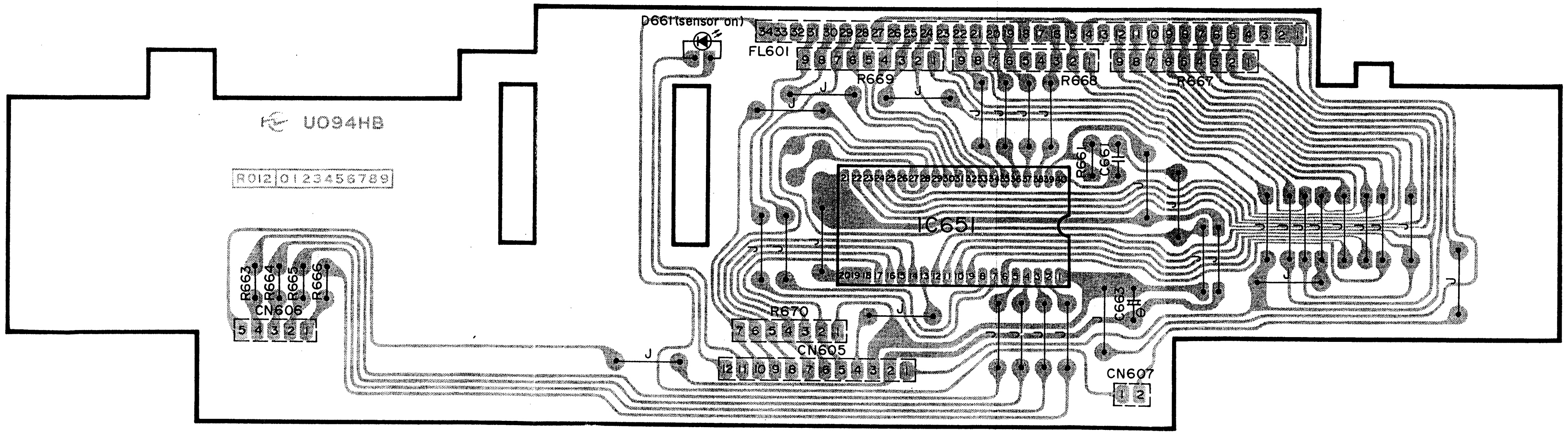
02 (Digital P.C.B.)


EXTERNAL
SYNCHRO REC
LINE OUT
(Lch)
(Rch)
Technics
SRDP008N02
CN702
CN703
CN201
CN202
CN203
CN212
CN204
CN205
CN206
CN207
CN209
CN210
CN211
CN208
CN216
CN213
CN214
CN801
CN802
BT215
Q82
Q81
Q404
Q601
Q401
Q402
Q403
Q611
Q612
Q802
IC401
IC402
IC403
IC404
IC405
IC406
IC407
IC408
IC409
IC410
IC411
IC412
IC413
IC414
IC415
IC611
IC612
IC613
IC614
IC615
IC701
IC702
IC703
IC704
IC705
IC801
IC802
IC803
IC804
IC805
IC806
IC807
LPF801
LPF802
RLY801
VR401
VR402
VR851
X401
D81
D82
D83
D84
D85
D401
D402
D404
D405
D631
D632
D633
D634
D635
D636
21

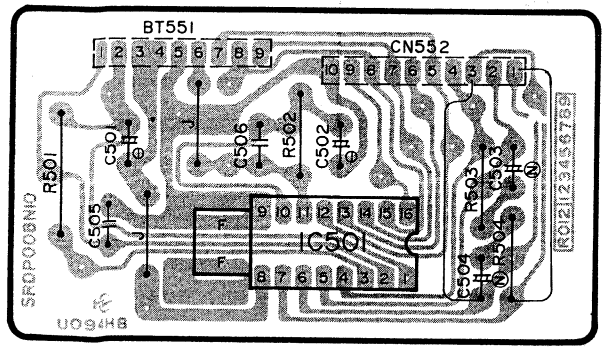
07 (Keyboard P.C.B.)


CN604
D654
(play ind.)
S653
(play)
S660
(pause/stop)
D653
(pause/stop ind.)
U094HB
S662
(open/close)
D652
(repeat ind.)
(music scan ind.)
D651
S663 (music scan)
S681 (repeat)
S655 (clear)
S674 (index)
S654 (memory)
S668 (5)
S667 (4)
S665 (2)
S664 (1)
S659
(search)
S658
(search)
S675 (time)
(pitch ind.)
D655
R651
S666 (3)
S651 (auto-pause)
timer auto
play — off — pause
S652
(pitch)
on
off
VR651
(pitch control)
S657
(skip)
CN603
S656
(skip)
CN602
S673 (0)
S672 (9)
S671 (8)
S670 (7)
S669 (6)
CN601
R01210123456789

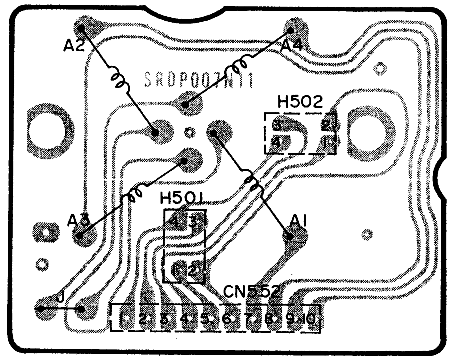
08 (FL display P.C.B.)


D661 (sensor on)
FL601
U094HB
R012 0123456789
R669
R668
R667
C661
C662
IC651
R663
R664
R665
R666
CN606
R670
CN605
C663
CN607

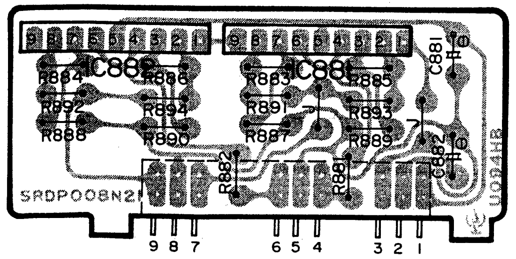
10 (Spindle motor drive P.C.B.)


BT551
CN552
C501
C506
R502
C502
R501
C505
IC501
R503
R504
C503
C504
SRDP008N10
U094HB
R012 123456789

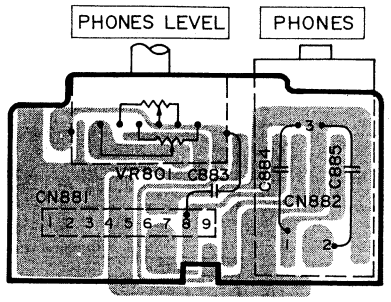
11 (Spindle motor drive coil P.C.B.)


A2
A4
SRDP007N11
H502
H501
A3
A1
CN552

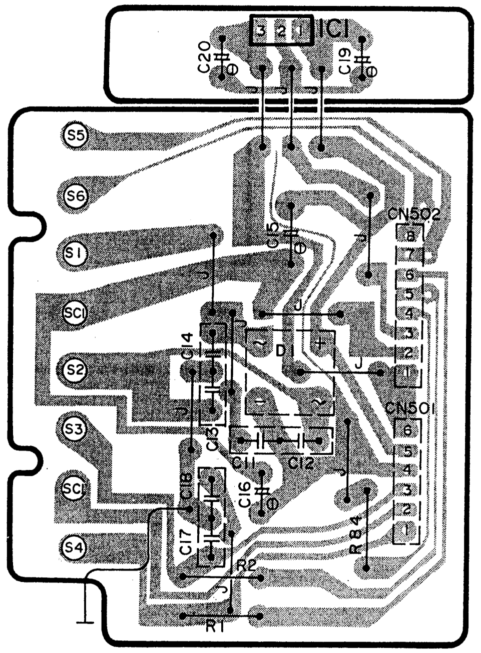
21 (Headphone amplifier P.C.B.)


IC882
IC881
C881
R884
R886
R892
R894
R888
R890
R883
R885
R891
R893
R887
R889
R882
R881
C882
SRDP008N21
U094HB
9 8 7
6 5 4
3 2 1

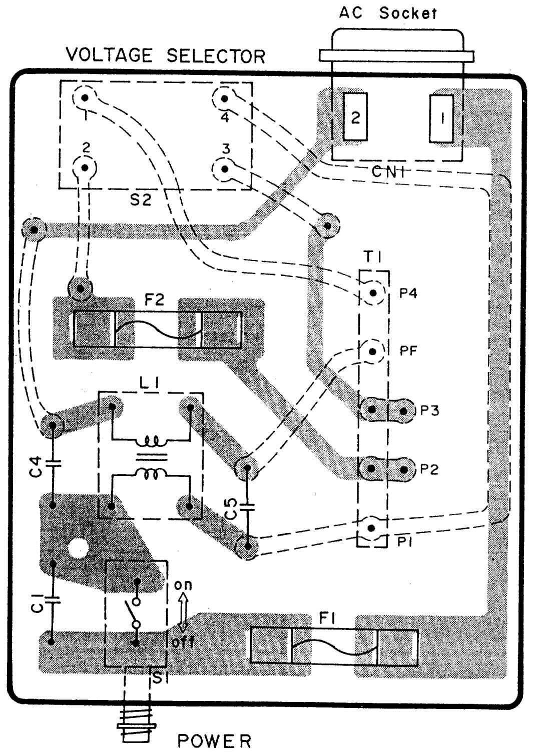
(Headphones terminal)


PHONES LEVEL
PHONES
VR801
C883
C884
C885
CN881
CN882

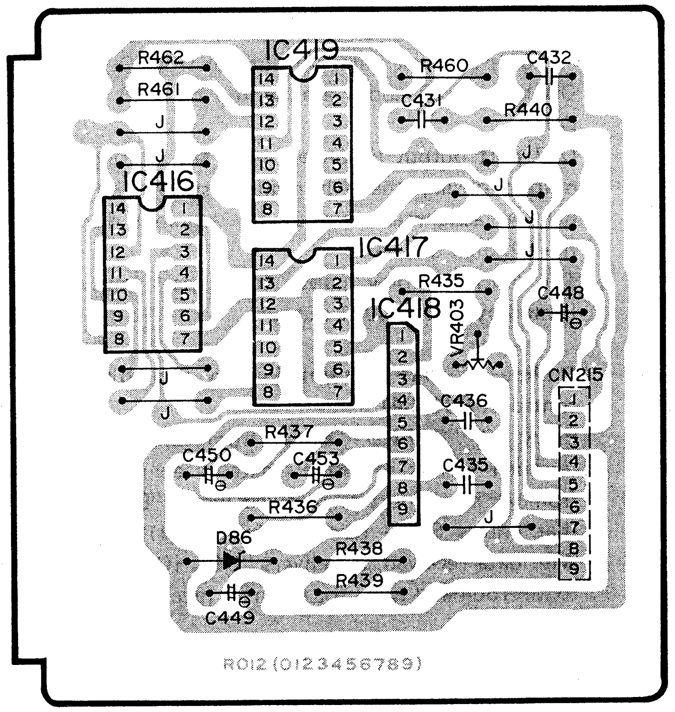
05 (Power supply P.C.B.)


IC1
C20
C19
S5
S6
S1
SC1
S2
S3
SC
S4
CN502
CN501
C15
C14
C13
C11
C12
C16
C18
C17
R2
R1
R84

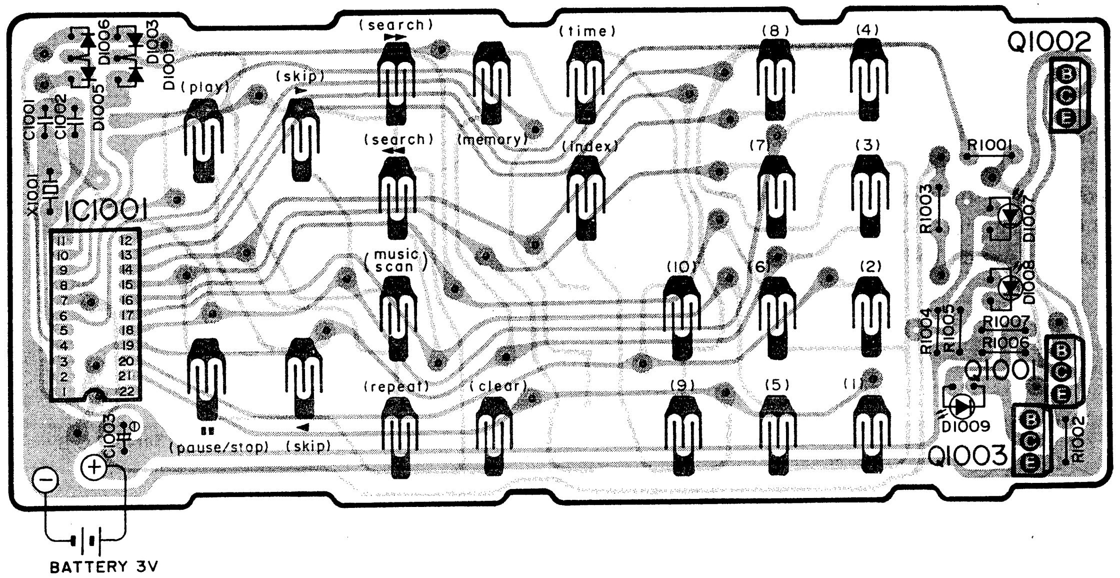
07 (Fuse P.C.B.)


AC Socket
VOLTAGE SELECTOR
S2
CN1
T1
P4
PF
P3
P2
P1
F2
L1
C4
C5
C1
on
off
S1
F1
POWER

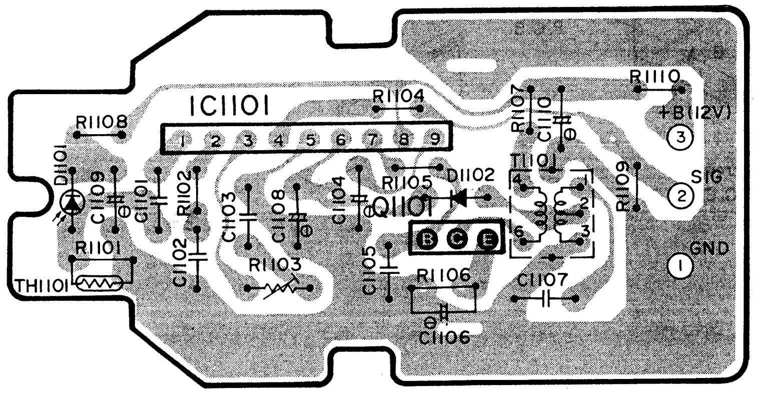
23 (Pitch control P.C.B.)


IC419
IC416
IC417
IC418
R462
R461
R460
R440
R435
R437
R436
R438
R439
C432
C431
C448
C436
C435
C450
C453
C449
VR403
CN215
D86
J
R012 (0123456789)

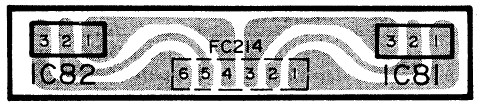
(Remote control transmitter P.C.B.)


(search)
(time)
(8)
(4)
Q1002
(play)
(skip)
(search)
(memory)
(index)
(7)
(3)
R1001
IC1001
X1001
C1001
C1002
D1001
D1002
D1003
D1004
D1005
D1006
D1007
D1008
(music scan)
(10)
(6)
(2)
R1003
R1004
R1005
R1006
R1007
(repeat)
(clear)
(9)
(5)
(1)
Q1001
D1009
Q1003
R1002
C1003
(pause/stop)
(skip)
BATTERY 3V

(Remote control receiver P.C.B.)


IC1101
R1108
R1104
R1107
C1110
R1110
+B(12V)
③
T1101
R1109
SIG
②
GND
①
D1101
C1109
C1101
R1102
C1103
C1108
C1104
R1105
D1102
Q1101
R1101
TH1101
C1102
R1103
C1105
R1106
C1107
C1106

22 (Regulator IC P.C.B.)


IC82
FC214
IC81
3 2 1
6 5 4 3 2 1
3 2 1

■ TERMINAL DESCRIPTION OF MICRO COMPUTER

- IC612 Operation control (MN1564PCL)

No.	Symbol	Block Name	Function	No.	Symbol	Block Name	Function
1	VSS	Power supply input terminal	Grounded (0V)	33	VDD	Power supply input terminal	5V
2	P00	P port	Data input terminals (from MN1421)	34	VMM	——	5V
3	P01			35	HLDM	——	
4	P02			36	P53	P port	Emphasis control output terminal
5	P03			37	P60		Track jump control output terminal
6	ST0	——	Not used in this unit	38	P61		
7	P10	P port	Data input terminal (from MN1421)	39	P62		Not used in this unit
8	P11		RF delay signal input	40	P63		TR ON signal output terminal
9	P12		Timer play select terminal (Timer play at "L")	41	P70	P port	Loading motor "closed" assignment output terminal
10	P13		Auto pause select terminal (Auto pause at "L")	42	P71		Loading motor "open" assignment output terminal
11	ST1	——	Not used in this unit.	43	P72		Track jump control output terminal
12	SYNC	——	Oscillation frequency for MN1421	44	P73		
13	SIRQ	——	Not used in this unit.	45	P80		TT ON signal output terminal
14	IRQ	——	Sub-code block clock input terminal	46	P81		Muting signal output terminal
15	SBT	——	Input terminal of frame clock generated by PCK	47	P82		Attenuation function control signal output terminal
16	SBD	——	Sub-code Q data input terminal	48	P83		Synchro record control signal output terminal
17	RST	Reset terminal	Reset with input at "L"	49	P90		Rest position detection signal
18	P20	P port	4K RAM address output terminal	50	P91		Outermost disc periphery detection terminal
19	P21			51	P92		Disc holder "closed" detection terminal
20	P22			52	P93		
21	P23			53	PA0		Disc holder "open" detection terminal
22	P30			54	PA1		DECHO signal input from FL drive (MN1430)
23	P31			55	PA2		FL drive (MN1430) data signal output terminal
24	P32			56	PA3		
25	P33			57	PB0		
26	P40	P port	4K RAM data input/output terminal	58	PB1		
27	P41			59	PB2		
28	P42			60	PB3		
29	P43			61	OSC2	Oscillation circuit	Not used in this unit
30	P50		4K RAM address output terminal	62	OSC1		System's reference clock (4.3218 MHz) input terminal
31	P51			63	TC1	——	Track counter terminal
32	P52		4K RAM WE signal terminal	64	TC0	——	Not used in this unit

- **IC611 Remote control decode (MN1421PCM)**

No.	Symbol	Block Name	Function
1	VSS	Power supply input terminal	Grounded (0V)
2	C09	C output port	"Sensor" indicator lights up with output at "L" during remote control mode.
3	C08		Data output (It allows local key operation and decodes it into operation control code.)
4	C07		Not used in this unit.
5	C06		Not used in this unit.
6	C05		Not used in this unit.
7	AI3	A input port	Key scan input
8	AI2		
9	AI1		
10	AI0		
11	BI3	B input port	Key scan input
12	BI2		
13	BI1		
14	BI0		
15	E00	E output port	Key scan output
16	E01		
17	E02		
18	E03		
19	TST	Test input terminal	Terminal for test. (Grounded)
20	$\overline{RST}$	Reset input terminal	All outputs are cleared or reset with input at "L".
21	SNS0	Sens. input terminal	It receives serial data from remote control.
22	SNS1	Sens. input terminal	Not used in this unit. (Grounded)
23	D00	D output port	Data output (It allows local key operation and decodes it into operation control code.)
24	D01		
25	D02		
26	D03		
27	VDD	Power supply input terminal	5V
28	OSC	Oscillation input terminal	Synchronizing signal input from operation control.

- **IC651 FL display (MN1430PCG)**

No.	Symbol	Block Name	Function
1	VSS	Power supply input terminal	15V
2	C011	C output port	"music scan" indicator lights up with output at "H"
3	C010		"repeat" indicator lights up with output at "H".
4	C09		"pause/stop" indicator lights up with output at "H".
5	C08		"play" indicator lights up with output at "H"
6	C07		FL segment-code (5th-one) lighting assignment output.
7	C06		FL display digit lighting assignment output
8	C05		
9	C04		
10	C03		
11	C02		
12	C01		
13	C00		DECHO signal output to operation control (MN1564)
14	AI3	A input port	Data input from operation control (MN1564)
15	AI2		
16	AI1		
17	AI0		
18	BI3	B input port	Not used in this unit. (Grounded)
19	BI2		
20	BI1		
21	BI0		
22	E00	E output port	FL segment-code (1st one) lighting assignment output.
23	E01		FL segment-code (2nd one) lighting assignment output.
24	E02		FL segment-code (3rd one) lighting assignment output.
25	E03		FL segment-code (4th one) lighting assignment output.
26	TST	Test input terminal	Test terminal (Connected to 15V.)
27	RST	Reset input terminal	Reset with input at "L"
28	CSLCT	——	Connected to 15V.
29	SNS0	Sens. input terminal	"DC LOCK" signal input from Operation control (MN1564)
30	SNS1	Sens. input terminal	"DSEND" signal input from Operation control (MN1564)
31	D00	D output port	"a" segment display output
32	D01		"b" segment display output
33	D02		"c" segment display output
34	D03		"d" segment display output
35	D04		"e" segment display output
36	D05		"f" segment display output
37	D06		"g" segment display output
38	D07		Colon (:) and over (▶) lighting assignment outputs
39	VDD	Power supply input terminal	Grounded (0V)
40	OSC	Oscillation input terminal	Clock signal

★Outline of FL ON operation

Display digits are determined by C output ports (C01 – C06); segment data are put out from D ports (D00 – D06); and bar codes are lighted by E00 – E03, C07, D07.

D07 port output becomes over (▶) lighting assignment output during the 4th digits display, and colon (:) lighting assignment output for segment display during the 5th digit display.

The 4 LED's (play, pause/stop, repeat, music scan) are lighted by C08 – C011 outputs.

★Outline of data transmission to and from operation controll (MN1564)

Entry of "DSEND" signal from MN1564 into SNS1 terminal results in display data receiving. Display data from A input port is received while "DCLOCK" signal that enters SNS0 terminal from MN1564 is checked. With data received, it delivers "DECHO" signal from C00 to MN1564 and waits for the next receiving timing.

■ HOW TO CHECK P.C.B.

***For removal of each part, refer to pages 10 ~ 15.**

- **Servo P.C.B.**

1. Remove the cabinet. **[Fig. 25]**
2. Check each part. **[Fig. 26]**
3. When checking the soldered parts on the servo P.C.B., raise the P.C.B. as in **Fig. 27.**
   (Tie the power switch rod to the servo P.C.B. with a string.)

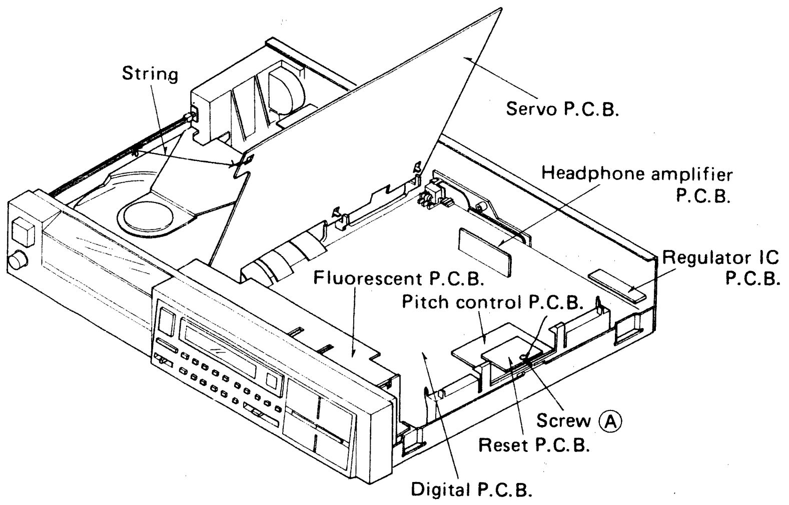


Fig. 27

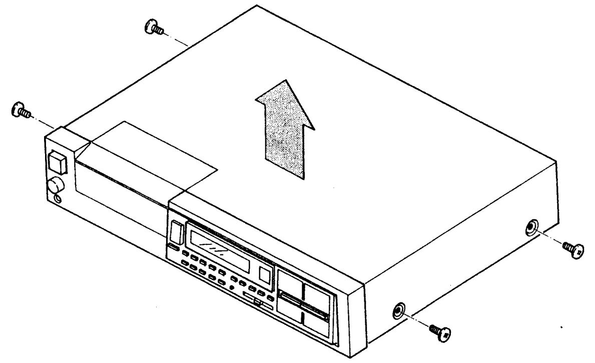


Fig. 25

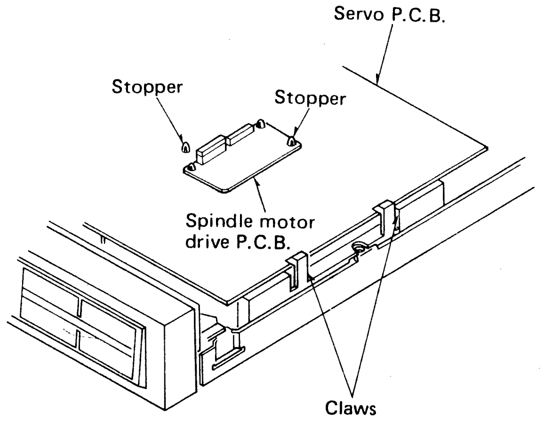


Fig. 26

- **Microcomputer reset P.C.B.**

1. Remove the cabinet.
2. Remove the servo P.C.B. to shift it as in **Fig. 27.**
3. Check each part. To check soldered parts, remove screw Ⓐ and turn over the P.C.B.

Caution: When supplying power wire screw Ⓐ removed, connect the earth terminal fastened with screw Ⓐ to the chassis.

- **Pitch control P.C.B.**

1. Remove the cabinet.
2. Remove the servo P.C.B. to shift it as in **Fig. 27.**
3. Remove screw Ⓐ and microcomputer reset circuit and pitch control P.C.B.
4. Again tighten screw Ⓐ to fit the microcomputer reset P.C.B.
5. Check such part with care so that the soldered parts of pitch control P.C.B. do not touch the other parts.

- **Fluorescent P.C.B. and keyboard P.C.B.**

1. Remove the cabinet.
2. Remove the front panel.
3. Remove the remote-control receiver. **[Fig. 28]**
4. Remove the P.C.B. setscrews. **[Fig. 28]**
5. Shift it as in **Fig. 29** and check.

Cautions:

(1) Take care not to damage FL.
(2) Take care not to allow the soldered parts of P.C.B. to touch the other parts.

- **Digital P.C.B.**

1. Remove the cabinet.
2. Remove the servo P.C.B. to shift it as in **Fig. 27,** and check each part.
3. How to check soldered parts:
   (1) Remove the front panel, FL P.C.B. and keyboard P.C.B.
   (2) Remove the P.C.B. holder setscrew. **[Fig. 30]**
   (3) Shift it as in **Fig. 29** and check.

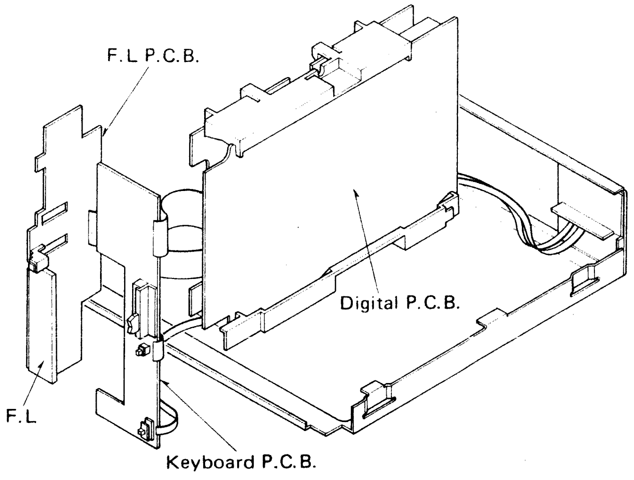

F.L P.C.B.
Digital P.C.B.
F.L
Keyboard P.C.B.

Fig. 29

- **Spindle motor drive P.C.B.**

1. Remove the cabinet.
2. Check each part.
3. To check soldered parts, remove stopper and turn over the P.C.B. **[Fig. 26]**

- **Regulator IC P.C.B.**

1. Remove the cabinet.
2. Remove the servo P.C.B. to shift it as in **Fig. 27.**
3. Check soldered parts.

- **Headphone amplifier P.C.B.**

1. Remove the cabinet.
2. Remove the servo P.C.B. to shift it as in **Fig. 27.**
3. Check each part.

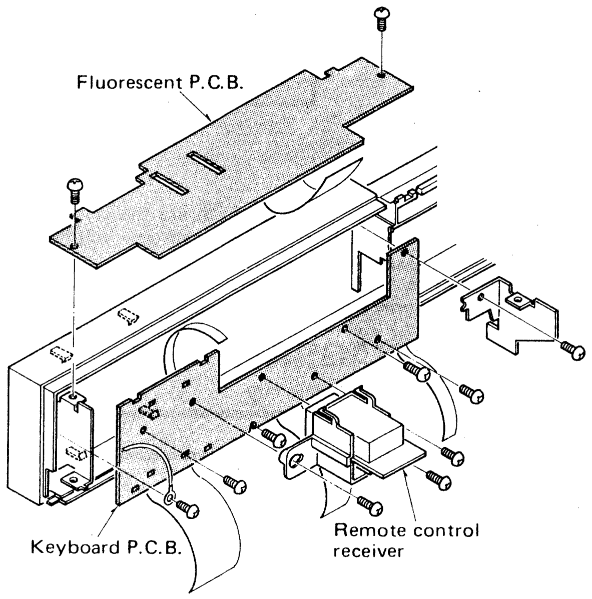

Fluorescent P.C.B.
Keyboard P.C.B.
Remote control receiver

Fig. 28

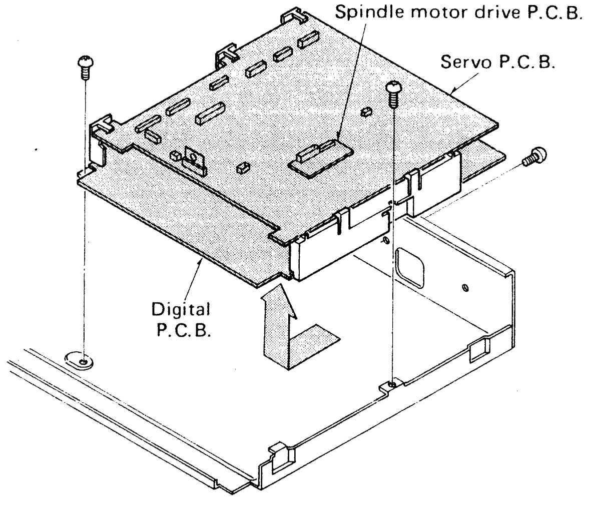

Spindle motor drive P.C.B.
Servo P.C.B.
Digital P.C.B.

Fig. 30

- **Head amplifier P.C.B.**

1. Remove the cabinet.
2. Remove the front panel, and FL P.C.B. and keyboard P.C.B.
3. Remove the 4 traverse unit setscrews. **[Fig. 31]**
4. Turn over the traverse unit, then remove the nut **[Fig. 32]** and traverse unit.
5. Fix the traverse unit on the jig (traverse unit mount). **[Fig. 33]**
6. Remove the head amp P.C.B. to check each part.
(*For the details, refer to the section of adjustmnent.)

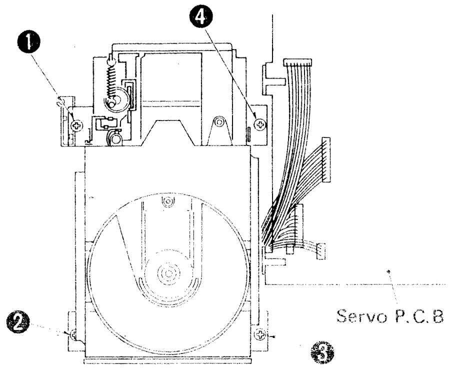

❶
❹
❷
Servo P.C.B
❸

Fig. 31

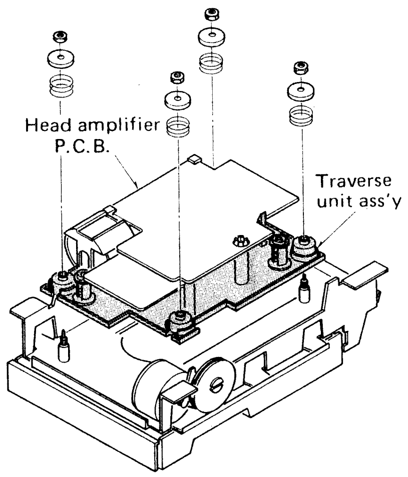

Head amplifier P.C.B.
Traverse unit ass'y

Fig. 32

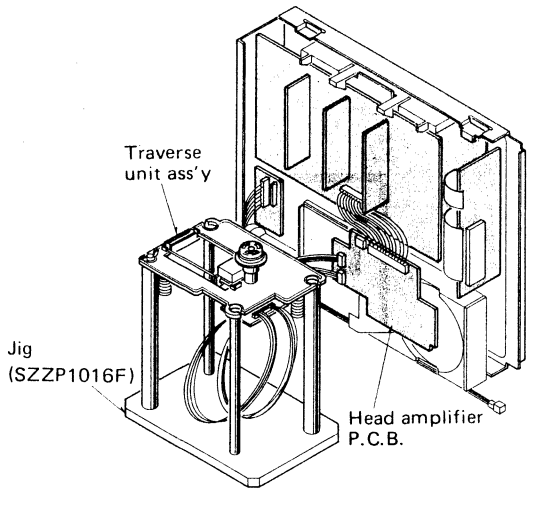
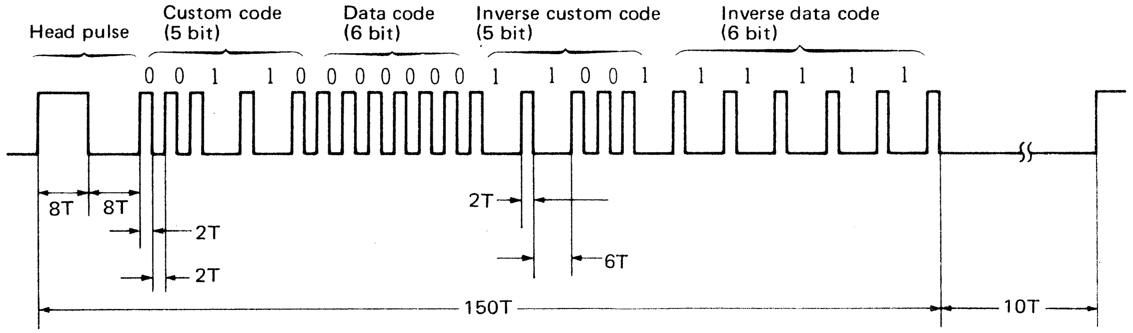
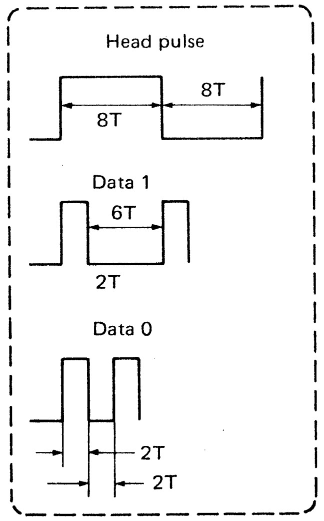

Traverse unit ass'y
Jig (SZZP1016F)
Head amplifier P.C.B.

Fig. 33

- **Remote control transmitter data code (MN6030).**


Head pulse
Custom code (5 bit)
Data code (6 bit)
Inverse custom code (5 bit)
Inverse data code (6 bit)
0 0 1 1 0 0 0 0 0 0 0 1 1 0 0 1 1 1 1 1 1
8T
8T
2T
2T
2T
6T
150T
10T

★1T = 0.420ms~0.424ms (U.S.A. and Canada)
1T = 0.454ms~0.460ms (Europe and Others)


Head pulse
8T
8T
Data 1
6T
2T
Data 0
2T
2T

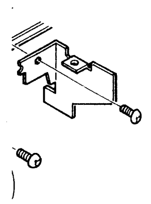
Button	Data code
1	0 0 0 0 1 0
2	1 0 0 0 1 0
3	0 1 0 0 1 0
4	1 1 0 0 1 0
5	0 0 1 0 1 0
6	1 0 1 0 1 0
7	0 1 1 0 1 0
8	1 1 1 0 1 0
9	0 0 0 1 1 0
0	1 0 0 1 1 0
index	0 0 0 1 0 1

Button	Data code
time	1 0 0 1 0 1
clear	0 0 0 0 0 0
memory	0 1 0 1 0 1
music scan	1 1 1 1 0 0
◀◀ search	0 0 1 0 0 0
search ▶▶	1 0 1 0 0 0
▮◀ skip	0 1 0 0 0 0
skip ▶▮	1 1 0 0 0 0
▮▮ pause/stop	0 1 1 0 0 0
play ▶	0 1 0 1 0 0

per and turn over

Fig. 27.

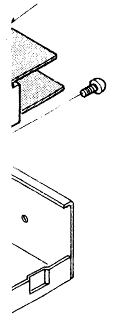
Fig. 27.



rol

or drive P.C.B.

ervo P.C.B.



- **Head amplifier P.C.B.**

1. Remove the cabinet.
2. Remove the front panel, and FL P.C.B. and keyboard P.C.B.
3. Remove the 4 traverse unit setscrews. **[Fig. 31]**
4. Turn over the traverse unit, then remove the nut **[Fig. 32]** and traverse unit.
5. Fix the traverse unit on the jig (traverse unit mount). **[Fig. 33]**
6. Remove the head amp P.C.B. to check each part. (*For the details, refer to the section of adjustmnent.)

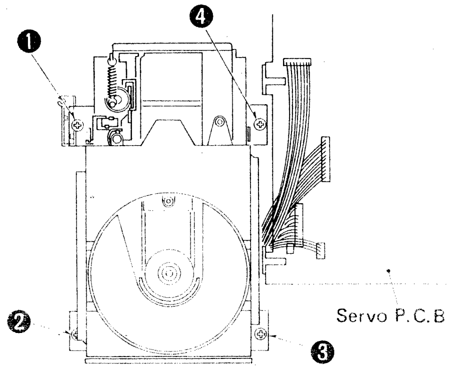

❶
❷
❸
❹
Servo P.C.B

Fig. 31

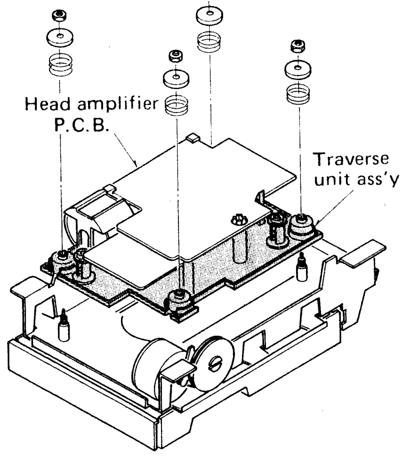

Head amplifier P.C.B.
Traverse unit ass'y

Fig. 32

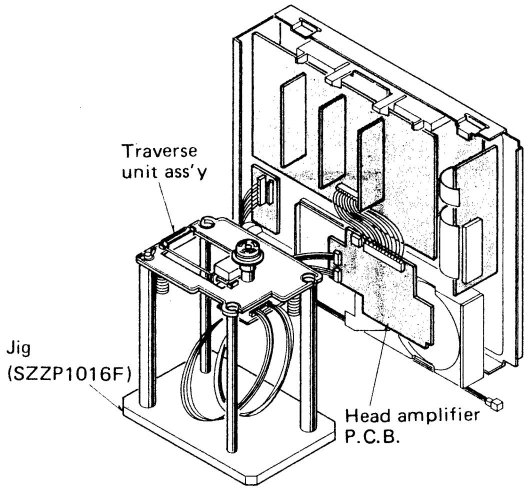
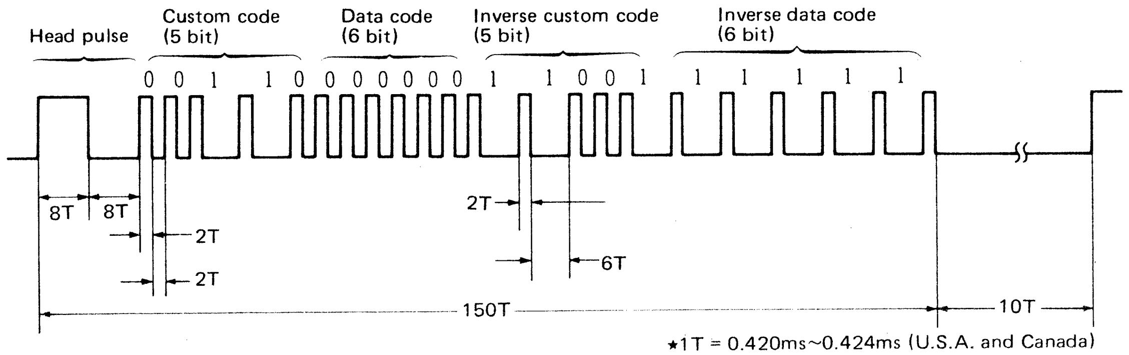
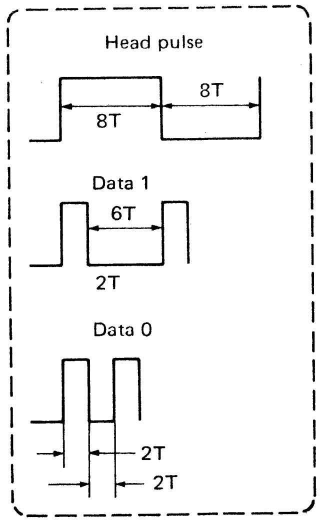

Traverse unit ass'y
Jig (SZZP1016F)
Head amplifier P.C.B.

Fig. 33

- **Remote control transmitter data code (MN6030).**


Head pulse
Custom code (5 bit)
Data code (6 bit)
Inverse custom code (5 bit)
Inverse data code (6 bit)
0 0 1 1 0 0 0 0 0 0 0 1 1 0 0 1 1 1 1 1 1
8T
8T
2T
2T
2T
6T
150T
10T

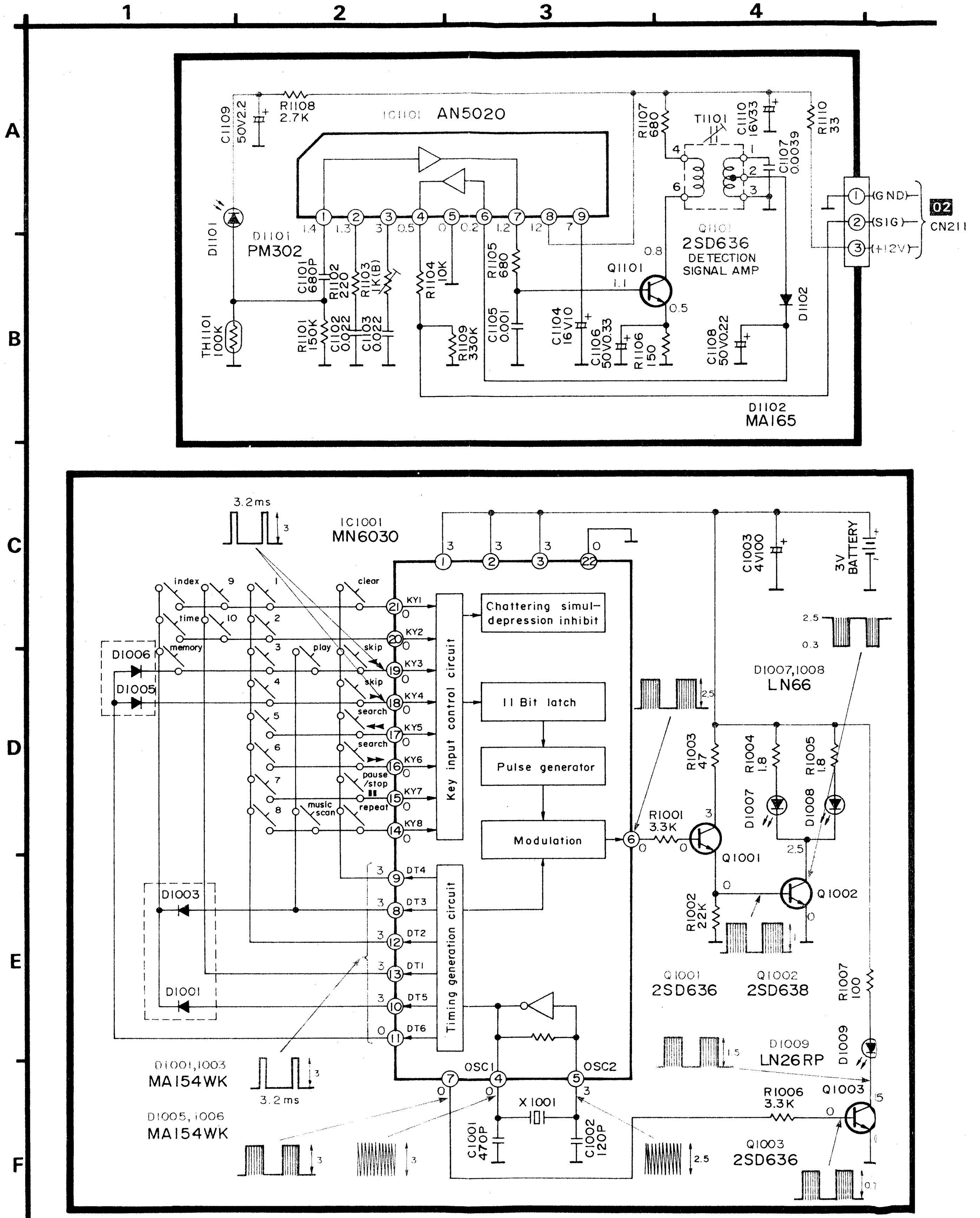
*1T = 0.420ms~0.424ms (U.S.A. and Canada)
1T = 0.454ms~0.460ms (Europe and Others)


Head pulse
8T
8T
Data 1
6T
2T
Data 0
2T
2T

Button	Data code
1	0 0 0 0 1 0
2	1 0 0 0 1 0
3	0 1 0 0 1 0
4	1 1 0 0 1 0
5	0 0 1 0 1 0
6	1 0 1 0 1 0
7	0 1 1 0 1 0
8	1 1 1 0 1 0
9	0 0 0 1 1 0
0	1 0 0 1 1 0
index	0 0 0 1 0 1

Button	Data code
time	1 0 0 1 0 1
clear	0 0 0 0 0 0
memory	0 1 0 1 0 1
music scan	1 1 1 1 0 0
◀◀ search	0 0 1 0 0 0
search ▶▶	1 0 1 0 0 0
◀◀ skip	0 1 0 0 0 0
skip ▶▶	1 1 0 0 0 0
❚❚ pause/stop	0 1 1 0 0 0
play ▶	0 1 0 1 0 0

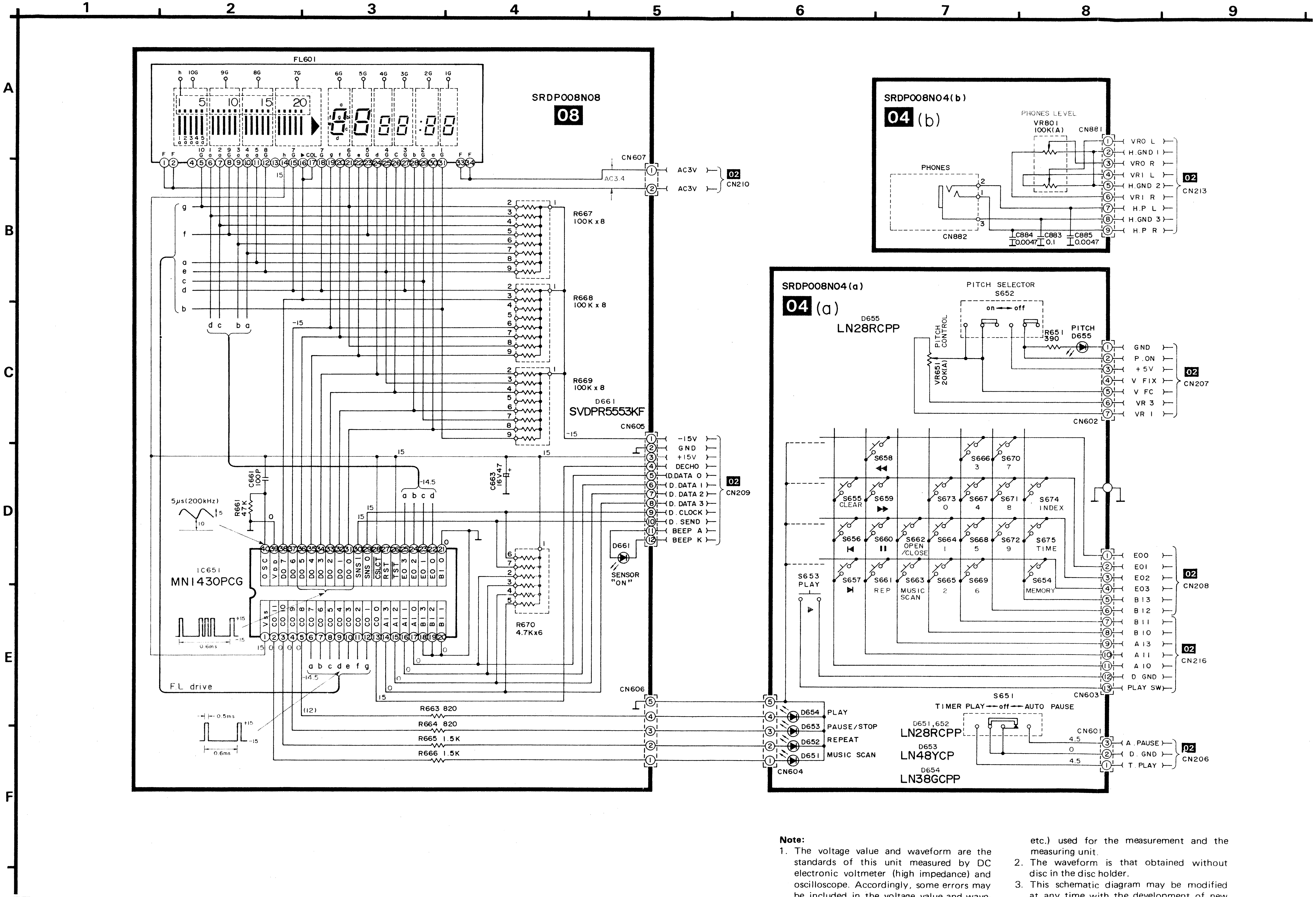
■ SCHEMATIC DIAGRAM Ⓐ (Remote control circuit)


1
2
3
4
A
B
C
D
E
F
IC1101 AN5020
C1109 50V2.2
R1108 2.7K
D1101
D1101 PM302
TH1101 100K
C1101 680P
R1101 150K
R1102 220
C1102 0.022
R1103 1K(B)
C1103 0.022
R1104 10K
R1109 330K
R1105 680
C1105 0.001
C1104 16V10
C1106 50V0.33
R1106 150
R1107 680
T1101
C1110 16V33
C1107 0.0039
R1110 33
Q1101
Q1101 2SD636 DETECTION SIGNAL AMP
C1108 50V0.22
D1102
D1102 MA165
(GND)
(SIG)
(+12V)
02
CN211
3.2ms
IC1001 MN6030
index
time
memory
clear
play
skip
search
pause /stop
music scan
repeat
KY1
KY2
KY3
KY4
KY5
KY6
KY7
KY8
DT1
DT2
DT3
DT4
DT5
DT6
D1006
D1005
D1003
D1001
Key input control circuit
Timing generation circuit
Chattering simul-depression inhibit
11 Bit latch
Pulse generator
Modulation
OSC1
OSC2
X1001
C1001 470P
C1002 120P
D1001,1003 MA154WK
D1005,1006 MA154WK
C1003 4V100
3V BATTERY
D1007,1008 LN66
R1001 3.3K
R1002 22K
R1003 47
R1004 1.8
R1005 1.8
D1007
D1008
Q1001
Q1002
Q1001 2SD636
Q1002 2SD638
R1007 100
D1009
D1009 LN26RP
R1006 3.3K
Q1003
Q1003 2SD636

Note:

1. The voltage value is the standards of this unit measured by DC electronic voltmeter (high impedance).
2. The waveform are those generated during signal transmission. ("play" button depressed for signal transmission.)
3. This schematic diagram may be modified at any time with the development of new technology.
4. —: +B voltage line.

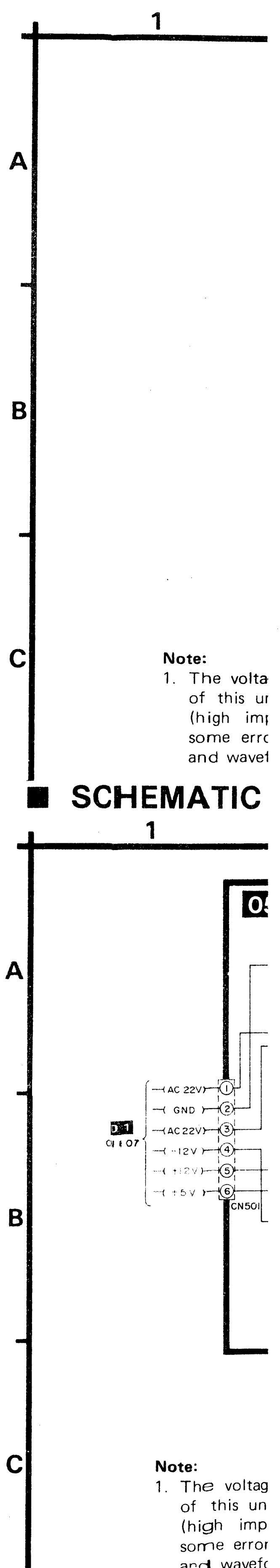
■ SCHEMATIC DIAGRAM Ⓑ (Display, keyboard and Headphones circuit)


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
FL601
SRDP008N08
08
R667 100K x 8
R668 100K x 8
R669 100K x 8
D661 SVDPR5553KF
CN607
AC3V
AC3.4
02 CN210
CN605
-15V
GND
+15V
DECHO
D.DATA 0
D.DATA 1
D.DATA 2
D.DATA 3
D.CLOCK
D.SEND
BEEP A
BEEP K
02 CN209
C661 100P
R661 47K
C663 16V47
5μs(200kHz)
IC651 MN1430PCG
R670 4.7Kx6
D661
SENSOR "ON"
FL drive
CN606
R663 820
R664 820
R665 1.5K
R666 1.5K
0.6ms
0.5ms
SRDP008N04(b)
04 (b)
PHONES LEVEL
VR801 100K(A)
CN881
PHONES
CN882
C884 0.0047
C883 0.1
C885 0.0047
VRO L
H.GND 1
VRO R
VR1 L
H.GND 2
VR1 R
H.P L
H.GND 3
H.P R
02 CN213
SRDP008N04(a)
04 (a)
D655 LN28RCPP
PITCH SELECTOR S652
on → off
PITCH CONTROL
VR651 20K(A)
R651 390
PITCH D655
GND
P.ON
+5V
V FIX
V FC
VR 3
VR 1
02 CN207
CN602
S658
S666 3
S670 7
S655 CLEAR
S659
S673 0
S667 4
S671 8
S674 INDEX
S656
S660
S662 OPEN /CLOSE
S664 1
S668 5
S672 9
S675 TIME
S653 PLAY
S657
S661 REP
S663 MUSIC SCAN
S665 2
S669 6
S654 MEMORY
E00
E01
E02
E03
B13
B12
02 CN208
B11
B10
A13
A11
A10
D GND
PLAY SW
02 CN216
CN603
CN604
D654 PLAY
D653 PAUSE/STOP
D652 REPEAT
D651 MUSIC SCAN
S651
TIMER PLAY ← off → AUTO PAUSE
D651,652 LN28RCPP
D653 LN48YCP
D654 LN38GCPP
CN601
A.PAUSE
D.GND
T.PLAY
02 CN206

Note:

1. The voltage value and waveform are the standards of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope. Accordingly, some errors may be included in the voltage value and waveform depending upon the internal impedance of DC electronic voltmter (tester, etc.) used for the measurement and the measuring unit.
2. The waveform is that obtained without disc in the disc holder.
3. This schematic diagram may be modified at any time with the development of new technology.
4. —: +B Voltage line.

■ SCHEMATIC


1
A
B
C
AC 22V
GND
AC22V
-12V
+12V
+5V
CN501
Q1107

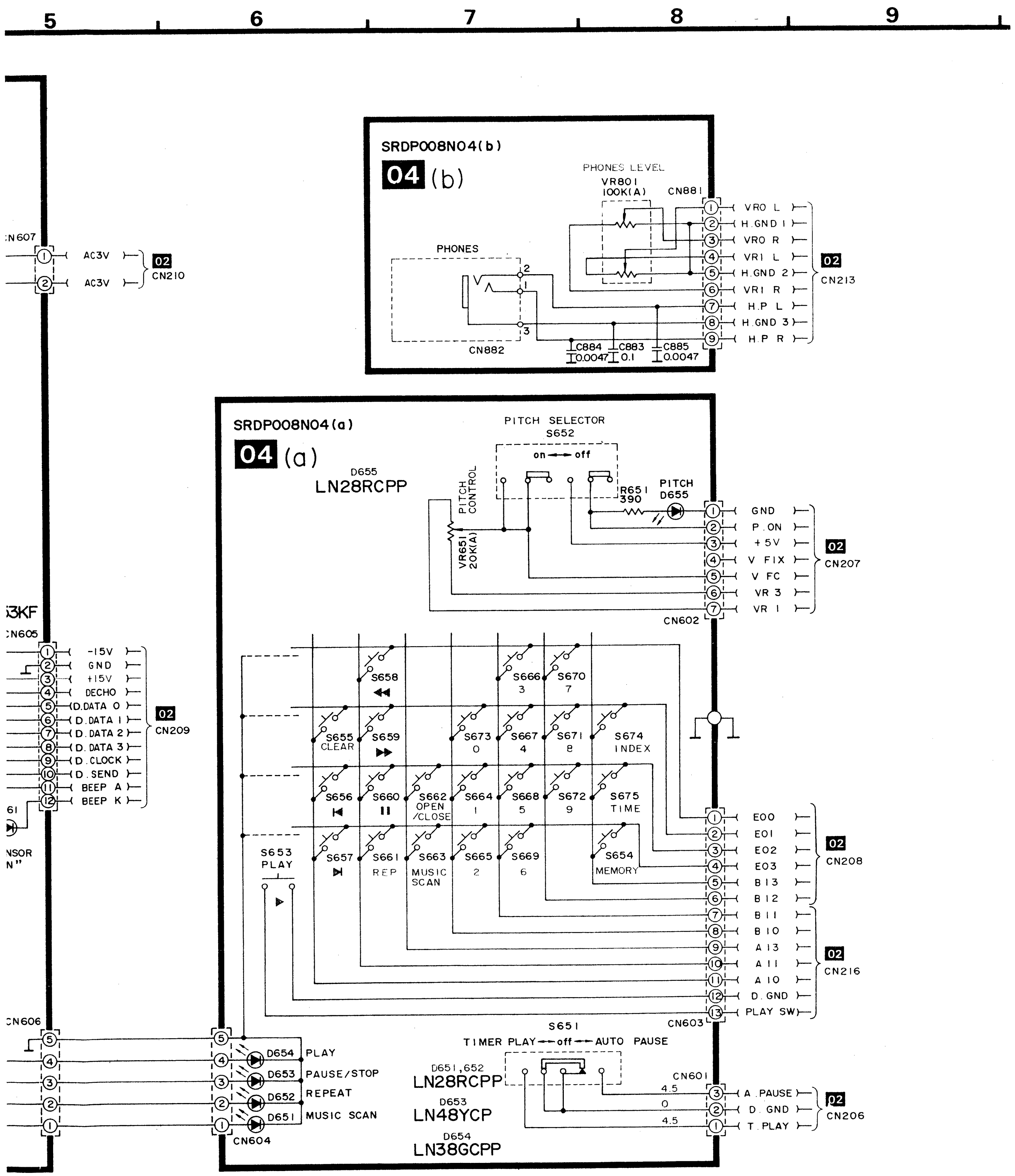
Note:

1. The volta of this u (high imp some erro and wave

■ SCHEMATIC

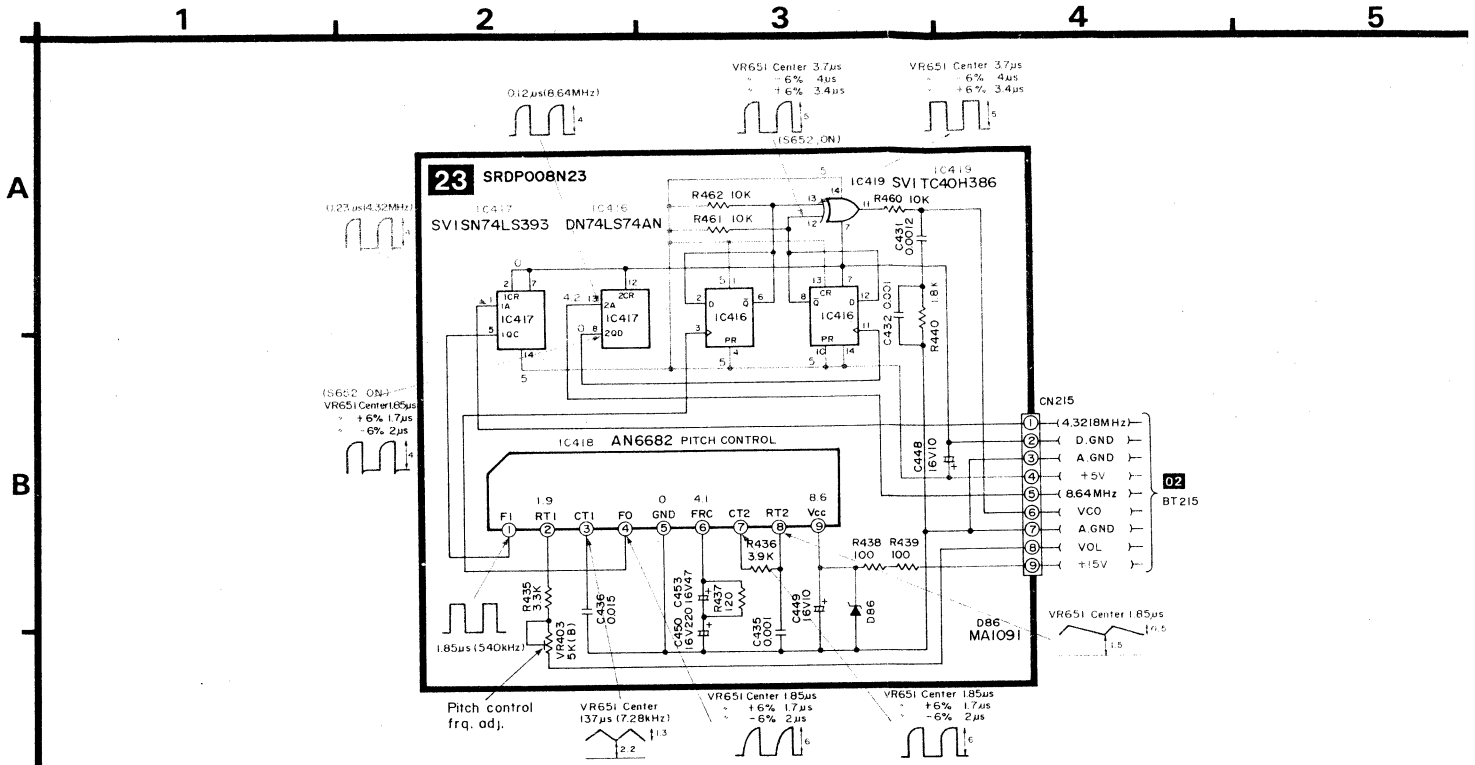
Note:

1. The voltag of this un (high imp some error and wavef ance of D


5
6
7
8
9
CN607
AC3V
AC3V
02
CN210
SRDP008N04(b)
04 (b)
PHONES LEVEL
VR801
100K(A)
CN881
PHONES
CN882
C884 0.0047
C883 0.1
C885 0.0047
VRO L
H.GND 1
VRO R
VRI L
H.GND 2
VRI R
H.P L
H.GND 3
H.P R
02
CN213
SRDP008N04(a)
04 (a)
D655
LN28RCPP
PITCH SELECTOR
S652
on — off
PITCH CONTROL
VR651 20K(A)
R651 390
PITCH
D655
GND
P.ON
+5V
V FIX
V FC
VR 3
VR 1
02
CN207
CN602
CN605
-15V
GND
+15V
DECHO
D.DATA 0
D.DATA 1
D.DATA 2
D.DATA 3
D.CLOCK
D.SEND
BEEP A
BEEP K
02
CN209
S658
S666 3
S670 7
S655 CLEAR
S659
S673 0
S667 4
S671 8
S674 INDEX
S656
S660
S662 OPEN/CLOSE
S664 1
S668 5
S672 9
S675 TIME
S653 PLAY
S657
S661 REP
S663 MUSIC SCAN
S665 2
S669 6
S654 MEMORY
E00
E01
E02
E03
B13
B12
B11
B10
A13
A11
A10
D.GND
PLAY SW
02
CN208
02
CN216
CN603
CN606
S651
TIMER PLAY — off — AUTO PAUSE
D654 PLAY
D653 PAUSE/STOP
D652 REPEAT
D651 MUSIC SCAN
CN604
D651, 652
LN28RCPP
D653
LN48YCP
D654
LN38GCPP
CN601
4.5
0
4.5
A.PAUSE
D.GND
T.PLAY
02
CN206

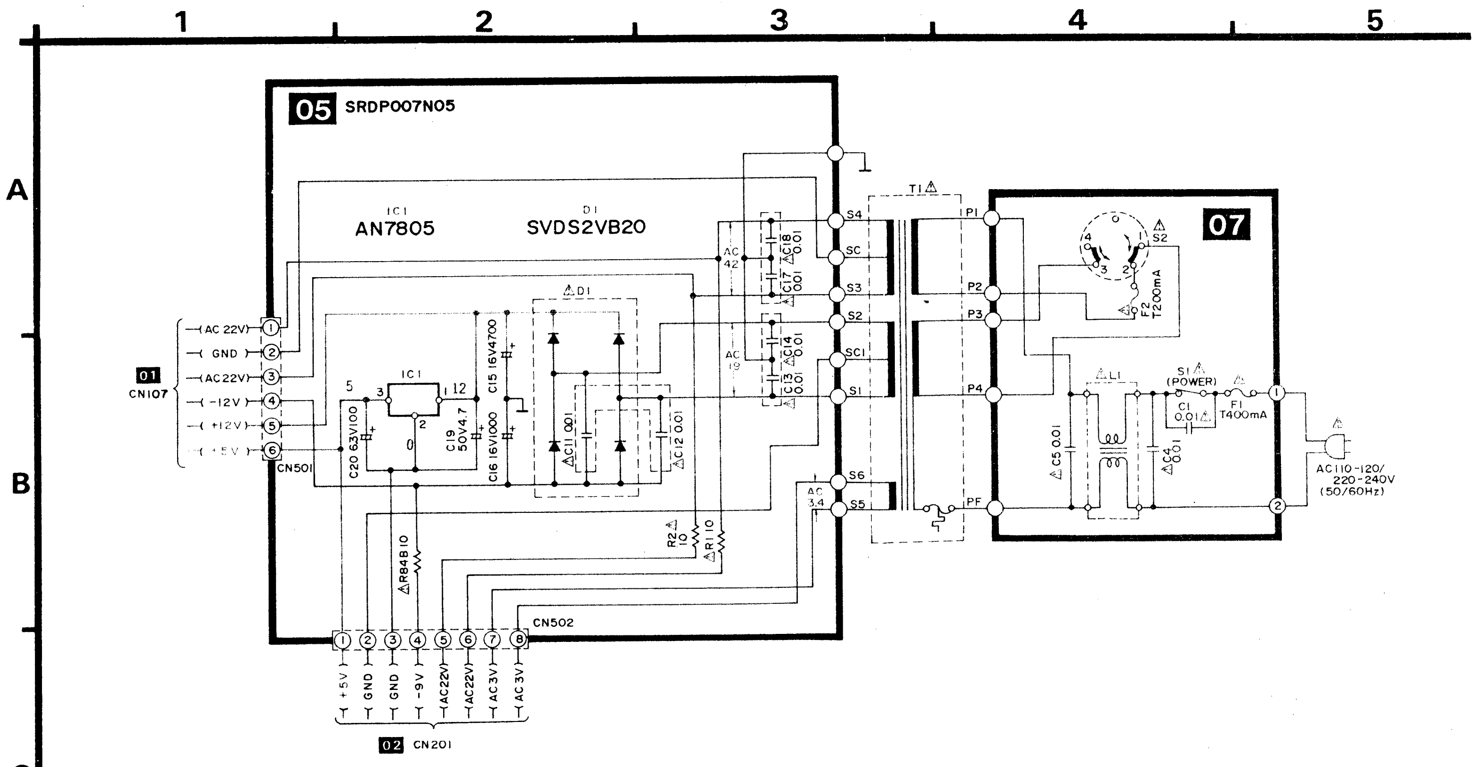
Note:
1. The voltage value and waveform are the standards of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope. Accordingly, some errors may be included in the voltage value and wave-from depending upon the internal impedance of DC electronic voltmter (tester, etc.) used for the measurement and the measuring unit.
2. The waveform is that obtained without disc in the disc holder.
3. This schematic diagram may be modified at any time with the development of new technology.
4. —: +B Voltage line.

■ SCHEMATIC DIAGRAM Ⓒ (Pitch control circuit)


1
2
3
4
5
A
B
C
23 SRDP008N23
IC417 SVISN74LS393
IC416 DN74LS74AN
IC419 SVITC40H386
R462 10K
R461 10K
R460 10K
IC417
IC416
IC418 AN6682 PITCH CONTROL
FI
RT1
CT1
FO
GND
FRC
CT2
RT2
Vcc
R436 3.9K
R438 100
R439 100
D86
D86 MA1091
VR403 5K(B)
R435 3.3K
CN215
4.3218MHz
D.GND
A.GND
+5V
8.64MHz
VCO
A.GND
VOL
+15V
02
BT215
Pitch control frq. adj.
1.85μs (540kHz)

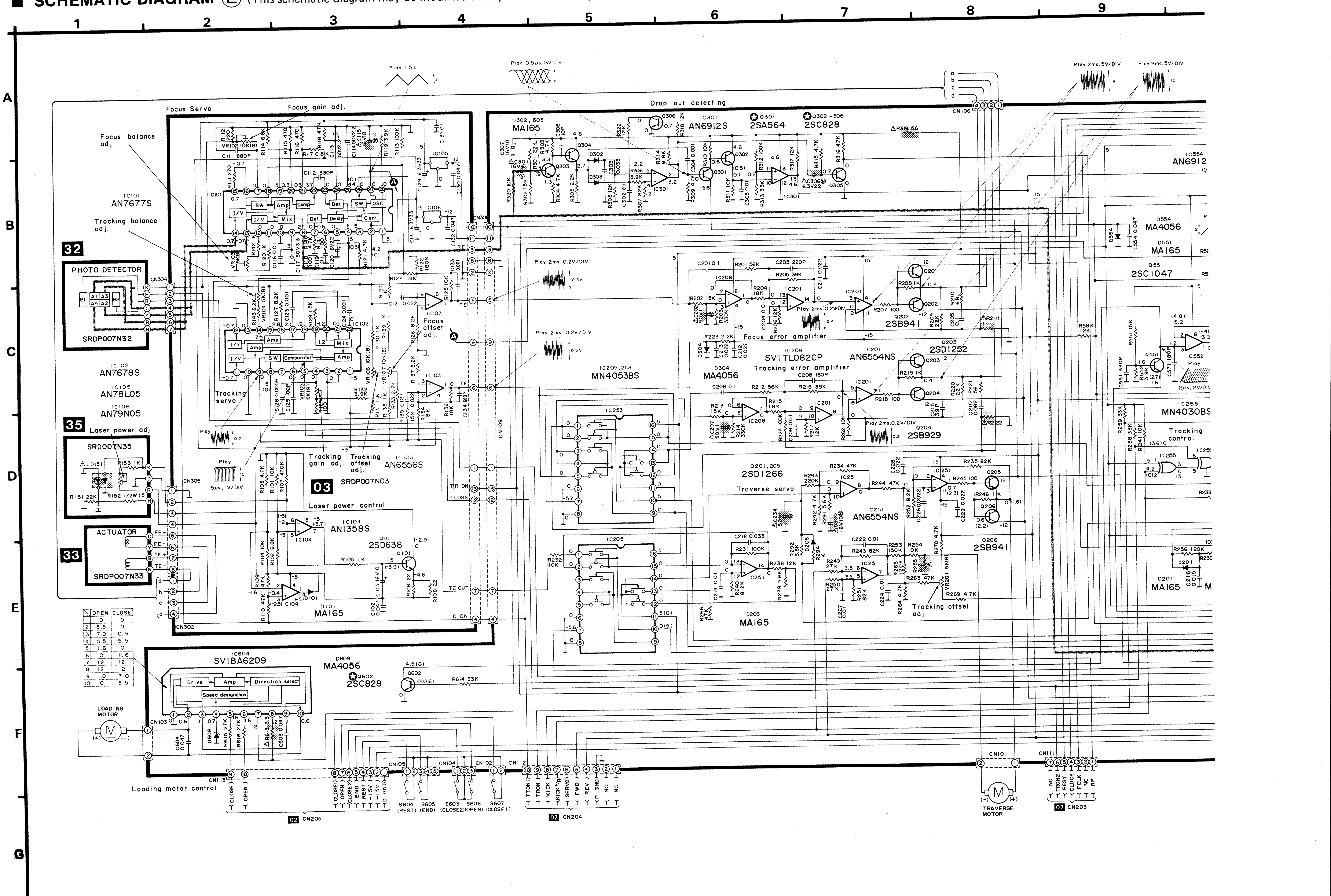
Note:
1. The voltage value and waveform are the standards of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope. Accordingly, some erros may be included in the voltage value and waveform depending upon the internal impedance of DC electronic voltmeter (tester, etc.) used for the measurement and the measuring unit.
2. This schematic diagram may be modified at any time with the development of new technology.
3. —: + B Voltage line.

■ SCHEMATIC DIAGRAM Ⓓ (Power supply circuit)

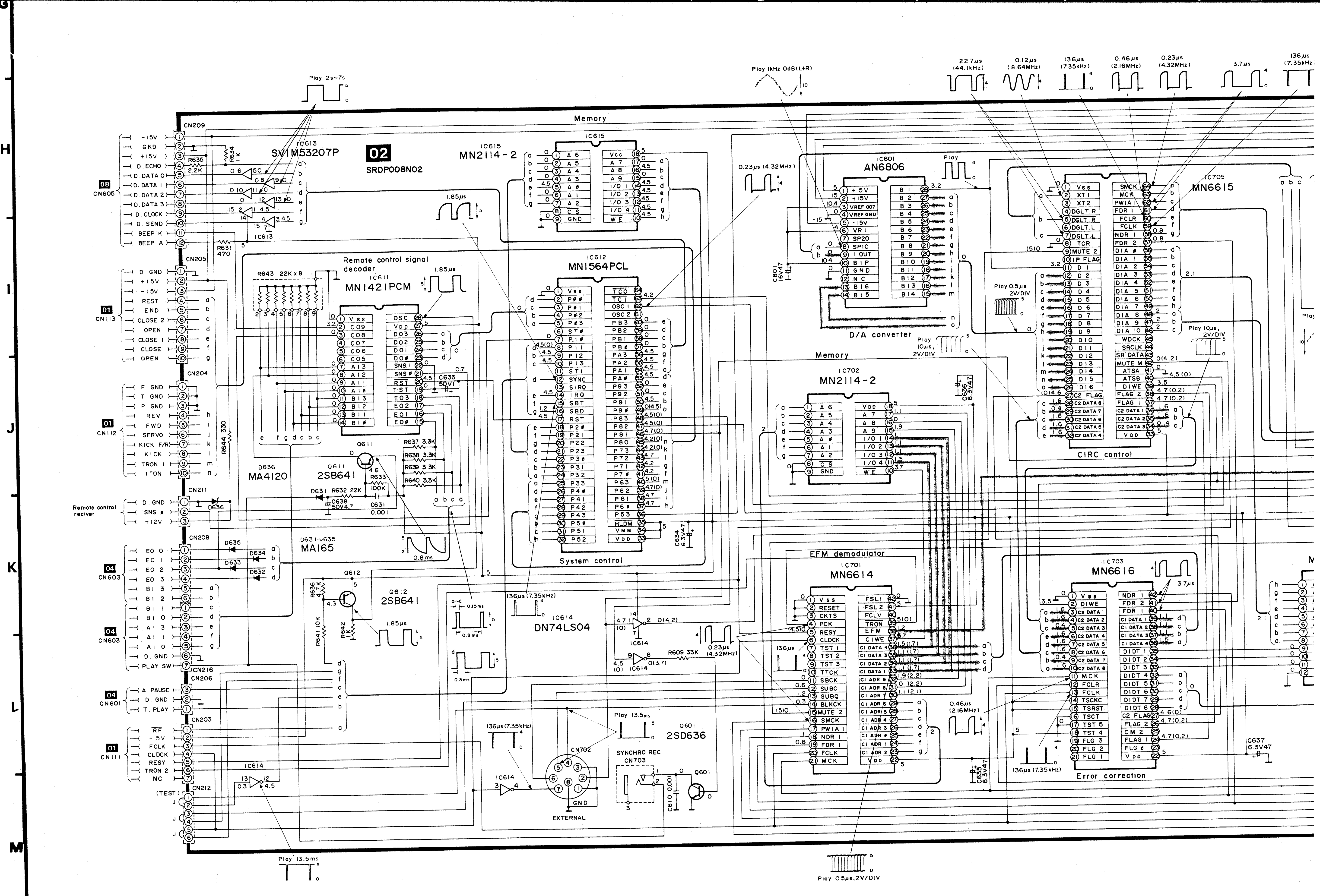

1
2
3
4
5
A
B
C
05 SRDP007N05
IC1
AN7805
D1
SVDS2VB20
T1
07
S1 (POWER)
F1 T400mA
F2 T200mA
AC110-120/220-240V (50/60Hz)
01
CN107
AC22V
GND
AC22V
-12V
+12V
+5V
CN501
CN502
+5V
GND
GND
-9V
AC22V
AC22V
AC3V
AC3V
02 CN201

Note:
1. The voltage value and waveform are the standards of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope. Accordingly, some errors may be included in the voltage value and waveform depdnding upon the internal impedance of DC electronic voltmeter (tester, etc.) used for the measurement and the measuring unit.
2. This schematic diagram may be modified at any time with the development of new technology.
3. Important safety notice:
   Components identifier by ⚠ make have special characteristics important for safety.
4. —: +B Voltage line.

■ SCHEMATIC DIAGRAM Ⓔ (This schematic diagram may be modified at any time the development of new technology.)

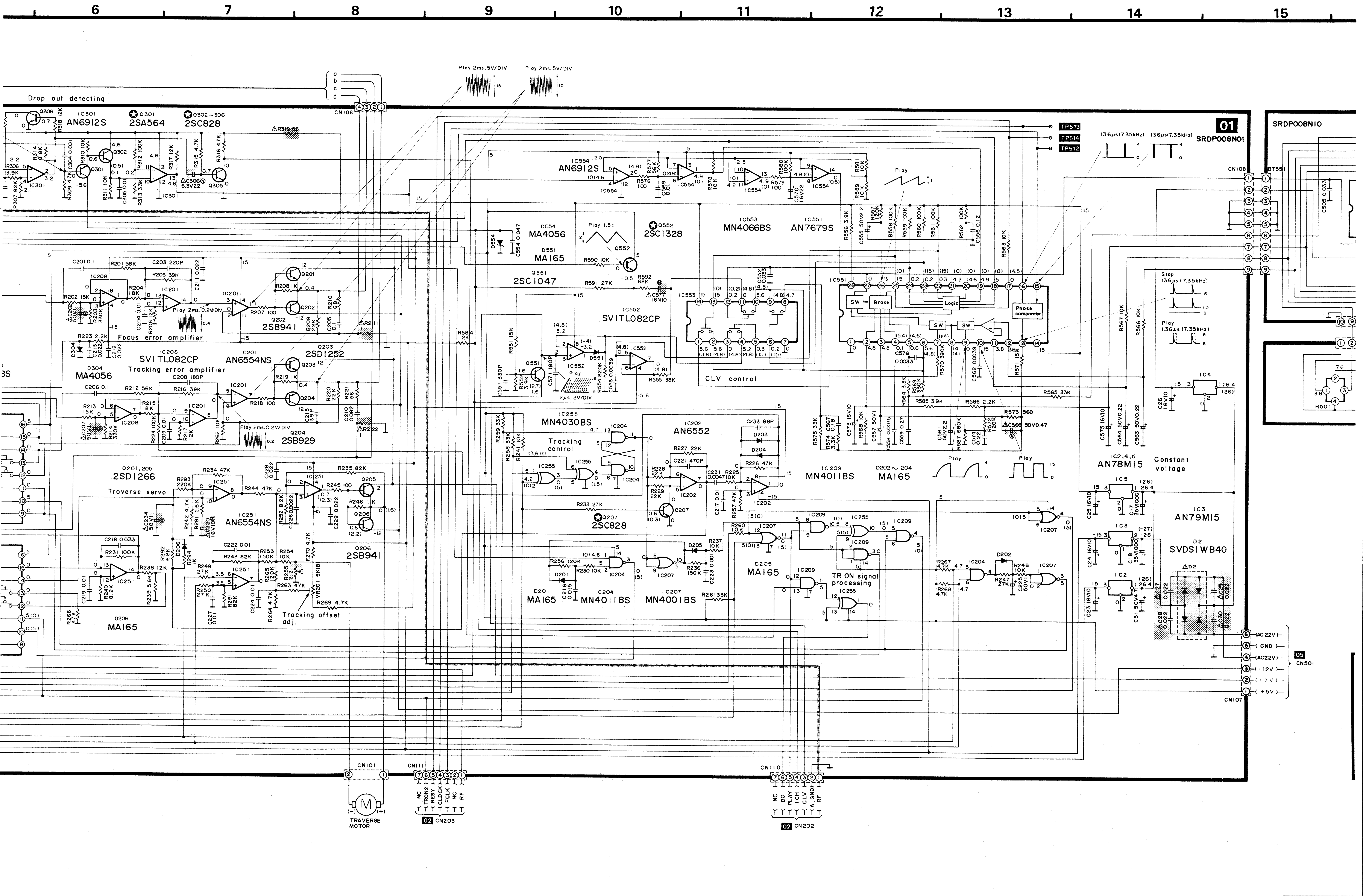

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
Focus Servo
Focus gain adj.
Focus balance adj.
Tracking balance adj.
IC101 AN7677S
IC102 AN7678S
IC105 AN78L05
IC106 AN79N05
32
PHOTO DETECTOR
SRDP007N32
CN304
35
Laser power adj
SRD007N35
LD151
R151 22K
R152 1/2W 15
R153 1K
33
ACTUATOR
SRDP007N33
FE+
FE−
TE+
TE−
CN305
CN302
Tracking servo
Tracking gain adj.
Tracking offset adj.
Focus offset adj.
IC103 AN6556S
03
SRDP007N03
Laser power control
IC104 AN1358S
Q101 2SD638
D101 MA165
Play 1.5s
Play 0.5μs, 1V/DIV
Play 2ms.0.2V/DIV
Play 2ms 0.2V/DIV
5μs, 1V/DIV
Drop out detecting
D302, 303 MA165
IC301 AN6912S
Q301 2SA564
Q302~306 2SC828
CN301
CN109
CN106
IC205,253 MN4053BS
IC253
IC205
IC208 SVI TL082CP
IC201 AN6554NS
Focus error amplifier
Tracking error amplifier
D304 MA4056
Q202 2SB941
Q203 2SD1252
Q204 2SB929
Q201,205 2SD1266
Traverse servo
IC251 AN6554NS
Q206 2SB941
D206 MA165
Tracking offset adj.
VR201 5K(B)
IC554 AN6912
D554 MA4056
D551 MA165
Q551 2SC1047
IC552
IC255 MN4030BS
Tracking control
D201 MA165
IC604 SVIBA6209
Drive
Amp.
Direction select
Speed designation
D609 MA4056
Q602 2SC828
R614 33K
LOADING MOTOR
CN103
Loading motor control
CN113
CLOSE
OPEN
CN105
CN104
CN102
CN112
S604 (REST)
S605 (END)
S603 (CLOSE2)
S608 (OPEN)
S607 (CLOSE1)
CLOSE1
OPEN
CLOSE2
END
REST
−15V
+15V
GND
TTON
TRON
KICK
KICK F/R
SERVO
FWD
REV
P.GND
NC
CN101
TRAVERSE MOTOR
CN111
TRON2
RESY
CLDCK
FCLK
RF
02 CN205
02 CN204
02 CN203
TE OUT
LD ON
TR ON
CLOSS
RF
FE
TE

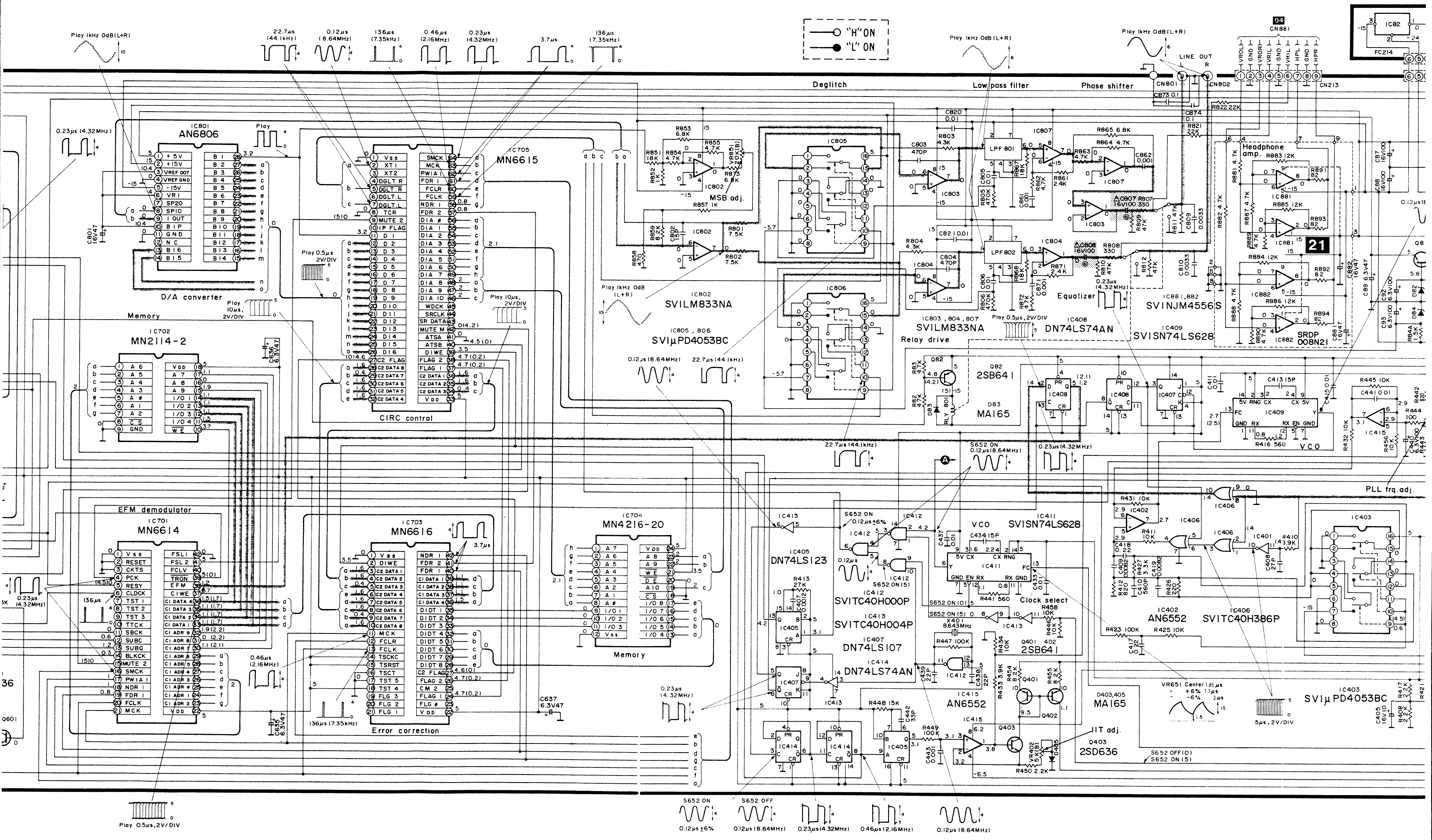
	OPEN	CLOSE
1	0	0
2	5.5	0
3	7.0	0.9
4	5.5	5.5
5	1.6	0
6	0	1.6
7	12	12
8	12	12
9	1.0	7.0
10	0	5.5

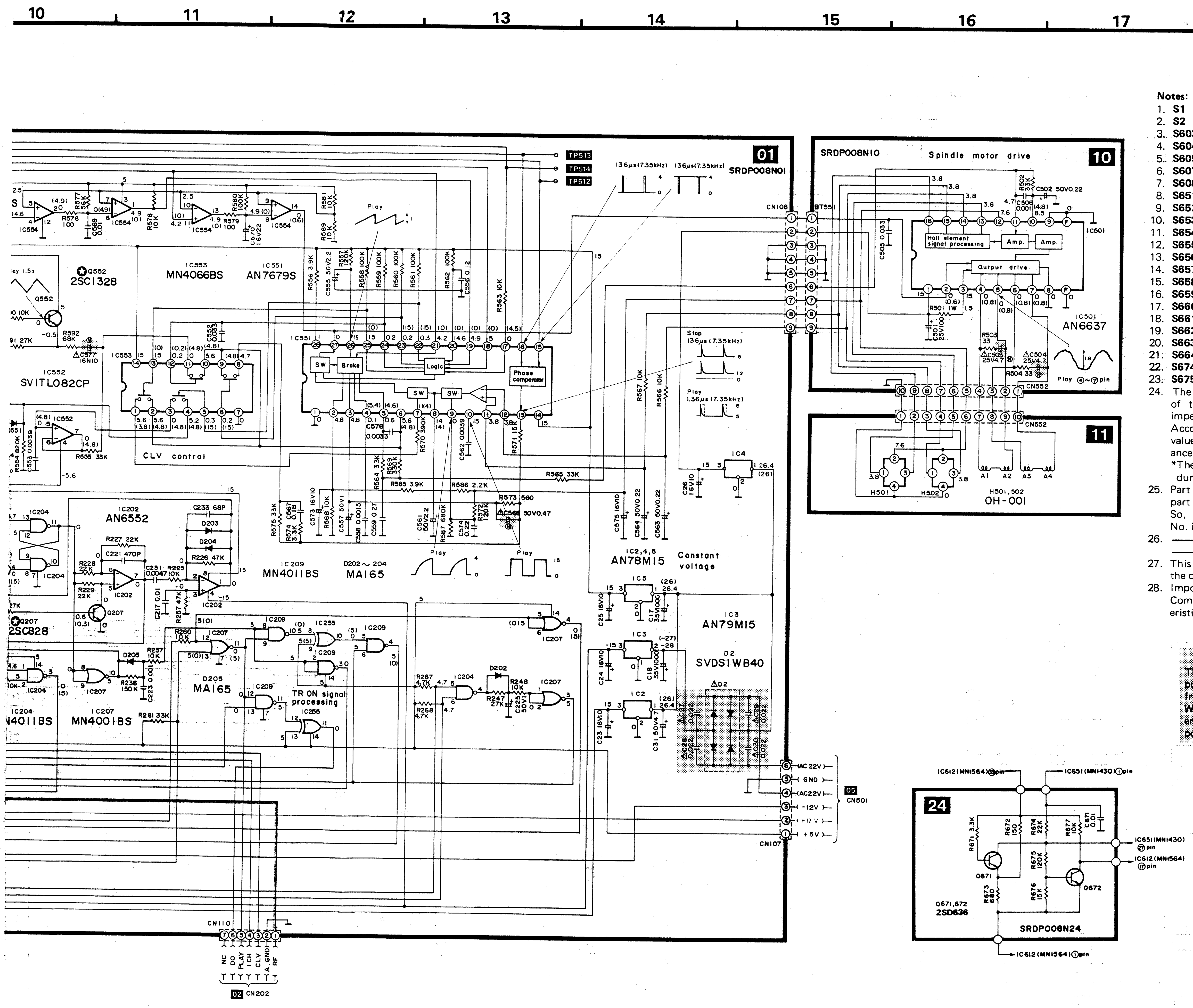


G
H
I
J
K
L
M
02
SRDP008N02
08
CN605
01
CN113
01
CN112
Remote control reciver
04
CN603
04
CN603
04
CN601
01
CN111
CN209
CN205
CN204
CN211
CN208
CN216
CN206
CN203
CN212
IC613
SVIM53207P
IC615
MN2114-2
Memory
IC612
MN1564PCL
System control
IC611
MN1421PCM
Remote control signal decoder
R643 22K x 8
Q611
2SB641
D636
MA4120
D631~635
MA165
Q612
2SB641
IC614
DN74LS04
IC801
AN6806
D/A converter
IC702
MN2114-2
Memory
IC701
MN6614
EFM demodulator
IC705
MN6615
CIRC control
IC703
MN6616
Error correction
Q601
2SD636
SYNCHRO REC
CN703
CN702
EXTERNAL
Play 2s~7s
Play 1kHz 0dB(L+R)
22.7μs (44.1kHz)
0.12μs (8.64MHz)
136μs (7.35kHz)
0.46μs (2.16MHz)
0.23μs (4.32MHz)
3.7μs
1.85μs
Play 0.5μs, 2V/DIV
Play 10μs, 2V/DIV
Play 13.5ms
136μs (7.35kHz)
0.8ms
0.15ms
0.3ms

of new technology.)


6
7
8
9
10
11
12
13
14
15
Drop out detecting
IC301 AN6912S
Q301 2SA564
Q302 ~ 306 2SC828
CN106
Play 2ms.5V/DIV
01
SRDP008N01
SRDP008N10
TP513
TP514
TP512
136μs(7.35kHz)
IC554 AN6912S
D554 MA4056
D551 MA165
Q552 2SC1328
Q551 2SC1047
IC553 MN4066BS
IC551 AN7679S
IC552 SVITL082CP
CLV control
Phase comparator
Logic
Brake
SW
CN108
BT551
Stop 136μs (7.35kHz)
Play 136μs (7.35kHz)
IC208 SVITL082CP
IC201 AN6554NS
Focus error amplifier
Tracking error amplifier
Q202 2SB941
Q203 2SD1252
Q204 2SB929
D304 MA4056
Play 2ms.0.2V/DIV
IC255 MN4030BS
Tracking control
IC202 AN6552
IC209 MN4011BS
D202 ~ 204 MA165
IC2,4,5 AN78M15
Constant voltage
IC3 AN79M15
D2 SVDS1WB40
Q201,205 2SD1266
Traverse servo
IC251 AN6554NS
Q206 2SB941
Q207 2SC828
D206 MA165
Tracking offset adj.
D201 MA165
IC204 MN4011BS
IC207 MN4001BS
D205 MA165
TR ON signal processing
H501
CN501
(AC 22V)
(GND)
(AC22V)
(−12V)
(+12V)
(+5V)
CN107
CN101
TRAVERSE MOTOR
CN111
NC
TRON2
RESY
CLDCK
FCLK
NC
RF
02 CN203
CN110
NC
DO
PLAY
1CH
CLV
A GND
RF
02 CN202


"H" ON
"L" ON
Deglitch
Low pass filter
Phase shifter
LINE OUT
L
R
CN801
CN802
CN881
CN213
IC82
FC214
IC801
AN6806
D/A converter
Memory
IC702
MN2114-2
IC705
MN6615
CIRC control
IC802
SVILM833NA
MSB adj.
IC805, 806
SVIμPD4053BC
IC803, 804, 807
SVILM833NA
Relay drive
IC807
IC803
IC804
IC805
IC806
LPF 801
LPF 802
Equalizer
IC408
DN74LS74AN
IC409
SVISN74LS628
IC881, 882
SVINJM4556S
Headphone amp.
IC881
IC882
SRDP 008N21
21
Q82
2SB641
D83
MA165
RLY 801
IC407
VCO
PLL frq. adj.
EFM demodulator
IC701
MN6614
IC703
MN6616
Error correction
IC704
MN4216-20
Memory
IC413
IC405
DN74LS123
IC412
SVITC40H000P
IC413
SVITC40H004P
IC407
DN74LS107
IC414
DN74LS74AN
IC415
AN6552
IC411
SVISN74LS628
Clock select
X401 8.643MHz
Q401, 402
2SB641
Q403
2SD636
IIT adj.
D403, 405
MA165
IC402
AN6552
IC406
SVITC40H386P
IC403
SVIμPD4053BC
VR651 Center 1.85μs
+6% 1.7μs
-6% 2μs
S652 OFF(0)
S652 ON(5)
Play 1kHz 0dB(L+R)
Play 0.5μs, 2V/DIV
Play 10μs, 2V/DIV
22.7μs (44.1kHz)
0.12μs (8.64MHz)
136μs (7.35kHz)
0.46μs (2.16MHz)
0.23μs (4.32MHz)
3.7μs
0.12μs ±6%
5μs, 2V/DIV
S652 ON
S652 OFF

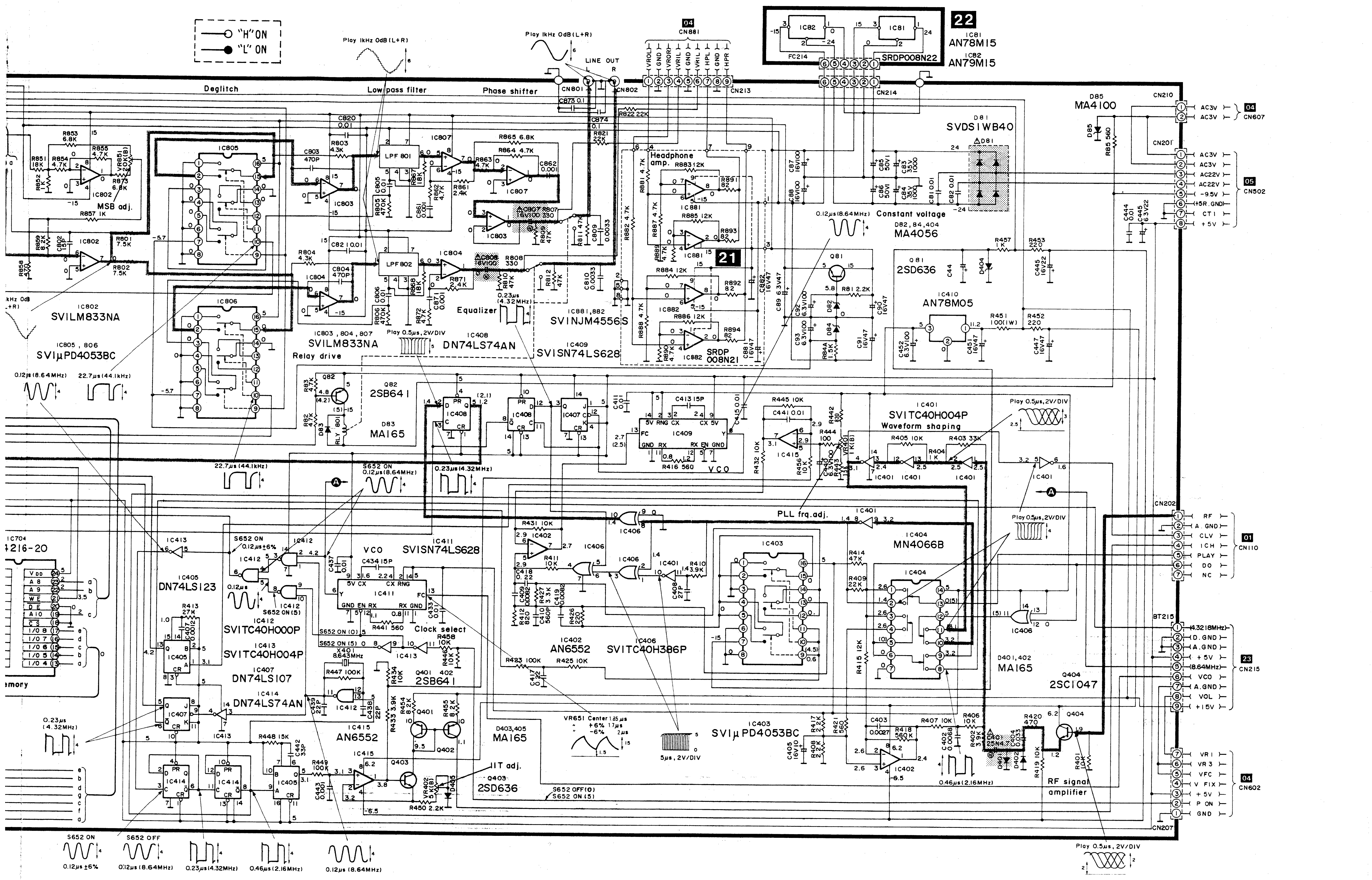

10
11
12
13
14
15
16
17
18
19
01
SRDP008N01
TP513
TP514
TP512
136μs(7.35kHz)
IC553
MN4066BS
IC551
AN7679S
IC552
SVITL082CP
Q552
2SC1328
CLV control
SW
Brake
Logic
Phase comparator
IC202
AN6552
IC209
MN4011BS
D202～204
MA165
D205
MA165
IC207
MN4001BS
IC204
MN4011BS
Q207
2SC828
TR ON signal processing
Play
Stop
IC2,4,5
AN78M15
Constant voltage
IC3
AN79M15
D2
SVDS1WB40
CN108
CN107
CN110
NC
DO
PLAY
I.CH
CLV
A.GND
RF
02 CN202
05 CN501
AC 22V
GND
AC22V
-12V
+12 V
+5V
10
SRDP008N10
Spindle motor drive
Hall element signal processing
Amp.
Output drive
IC501
AN6637
Play ④～⑦pin
CN552
11
H501,502
OH-001
A1
A2
A3
A4
24
SRDP008N24
Q671,672
2SD636
IC612(MN1564)⑬pin
IC651(MN1430)①pin
IC651(MN1430) ㉗pin
IC612(MN1564) ⑰pin
IC612(MN1564)①pin

Notes:

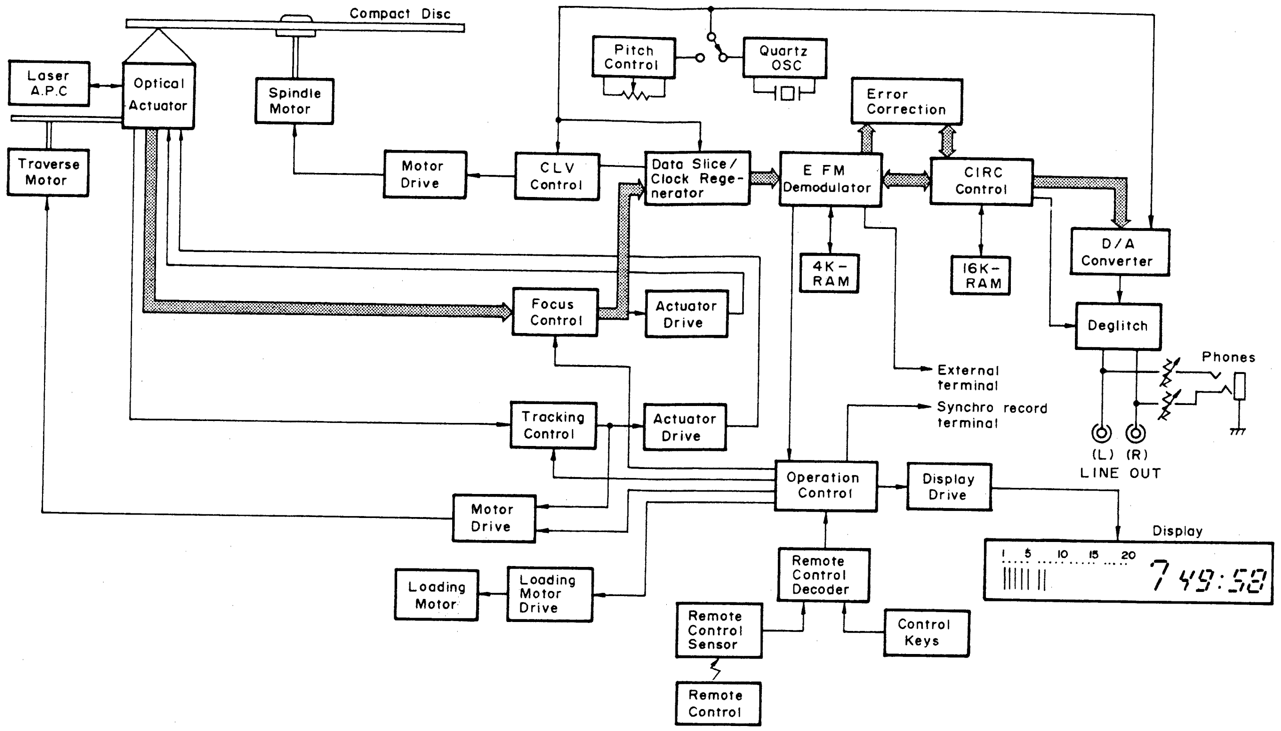
1. **S1** : Power switch.
2. **S2** : Voltage selector switch.
3. **S603** : Disc holder close detection switch.
4. **S604** : Rest switch. (Disc innermost position detection)
5. **S605** : End switch. (Disc outside detection)
6. **S607** : Disc holder close detection switch.
7. **S608** : Disc holder open detection switch.
8. **S651** : Auto-pause/timer switch.
9. **S652** : Pitch on/off switch.
10. **S653** : Play switch.
11. **S654** : Memory switch.
12. **S655** : Program clear switch.
13. **S656** : Backward skip switch.
14. **S657** : Forward skip switch.
15. **S658** : Backward search switch.
16. **S659** : Forward search switch.
17. **S660** : Pause/stop switch.
18. **S661** : Repeat switch.
19. **S662** : Disc holder open/close switch.
20. **S663** : Music scan switch.
21. **S664** ~ **S673** : Nemeric switch.
22. **S674** : Index switch.
23. **S675** : Time switch.
24. The voltage value, and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
    Accordingly, there may arise some error in the voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
    *The parenthesized are the values of voltage generated during playing. Others are the voltage values in stop mode.
25. Part No. with ✪ mark are not identical between regular part No. and repair part No. supplied.
    So, when placing an order for repair parts, use the part No. in the replacement part list of repair parts.
26. ——— : +B voltage lines. ⟹ : Audio signal lines.
    ——— : –B voltage lines.
27. This schematic diagram may be modified at any time with the development of new technology.
28. Important safety notice:
    Components identifier by ⚠ make have special characteristics important for safety.

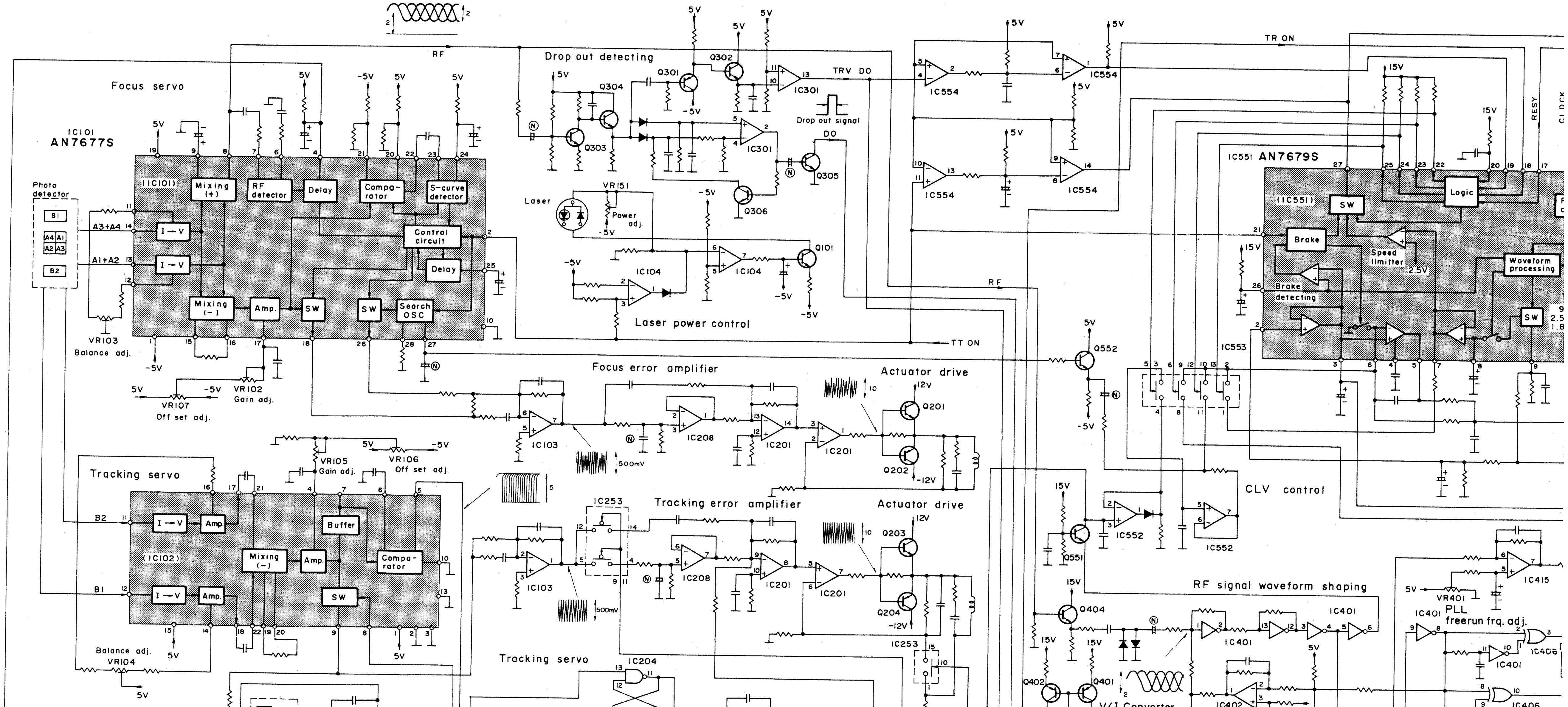
IMPORTANT SAFETY NOTICE

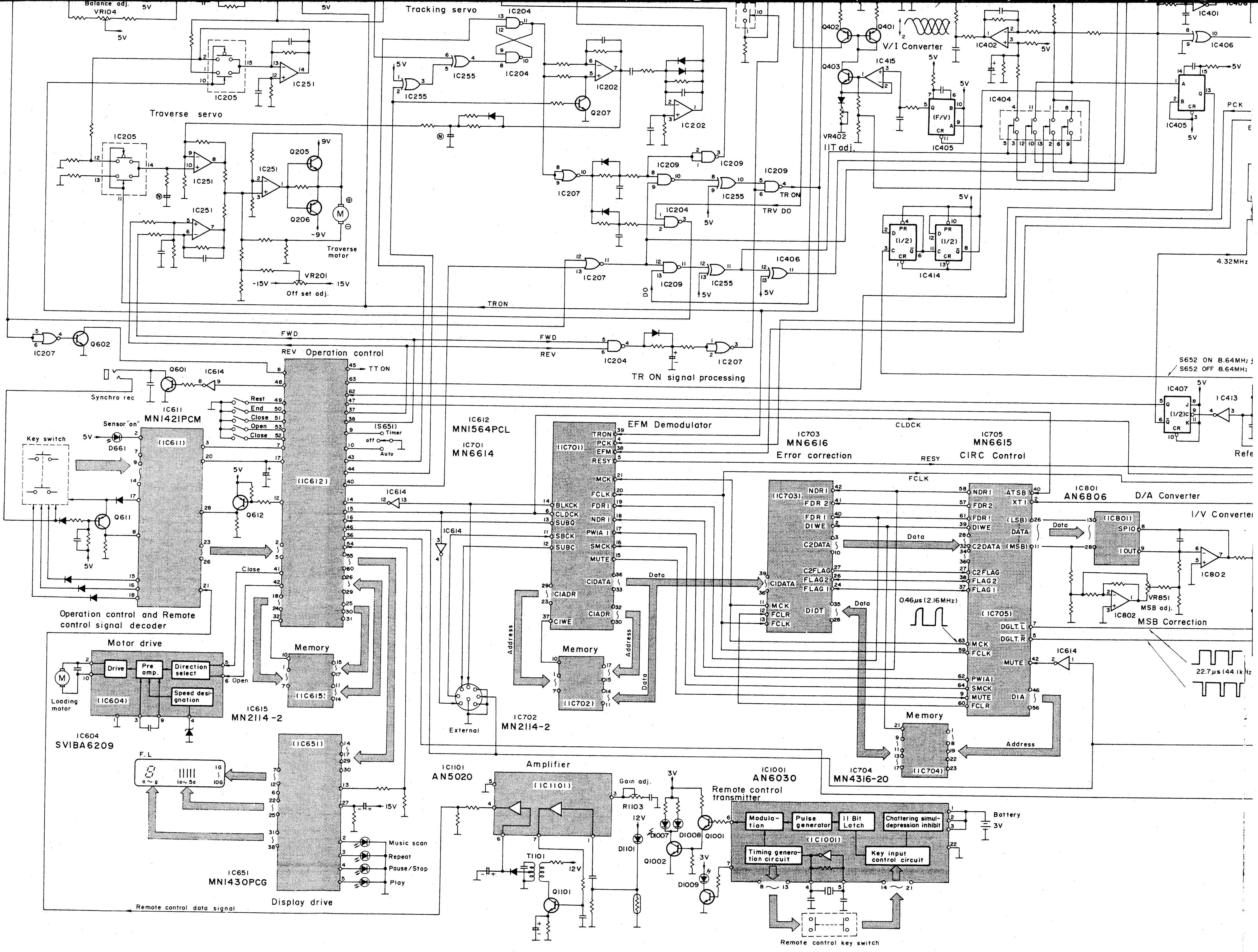
The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.


"H" ON
"L" ON
Deglitch
Low pass filter
Phase shifter
Play 1kHz 0dB (L+R)
LINE OUT
L
R
CN801
CN802
CN881
CN213
CN214
22
IC81 AN78M15
IC82 AN79M15
SRDP008N22
FC214
CN210
CN607
CN201
CN502
AC3V
AC22V
-9.5V
+5R.GND
CT1
+5V
D85 MA4100
D81 SVDS1WB40
Headphone amp.
IC881
IC882
21
SRDP 008N21
Constant voltage
D82, 84, 404 MA4056
Q81 2SD636
IC410 AN78M05
IC802 SVILM833NA
IC805, 806 SVIμPD4053BC
IC803, 804, 807 SVILM833NA
Relay drive
MSB adj.
Equalizer
IC408 DN74LS74AN
IC409 SVISN74LS628
Q82 2SB641
D83 MA165
IC401 SVITC40H004P
Waveform shaping
VCO
PLL frq.adj.
IC404 MN4066B
IC403 SVIμPD4053BC
IC402 AN6552
IC406 SVITC40H386P
IC405 DN74LS123
IC412 SVITC40H000P
IC413 SVITC40H004P
IC407 DN74LS107
IC414 DN74LS74AN
IC411 SVISN74LS628
IC415 AN6552
Clock select
Q401, 402 2SB641
Q403 2SD636
IIT adj.
D403, 405 MA165
D401, 402 MA165
Q404 2SC1047
RF signal amplifier
VR651 Center 1.85μs +6% 1.7μs -6% 2μs
S652 ON
S652 OFF
S652 ON 0.12μs (8.64MHz)
0.12μs ±6%
0.12μs (8.64MHz)
0.23μs (4.32MHz)
0.46μs (2.16MHz)
22.7μs (44.1kHz)
5μs, 2V/DIV
Play 0.5μs, 2V/DIV
CN202
CN110
RF
A.GND
CLV
ICH
PLAY
DO
NC
BT215
CN215
4.3218MHz
D.GND
VCO
VOL
+15V
CN602
VR1
VR3
VFC
V FIX
P ON
GND
CN207
IC704
4216-20
memory

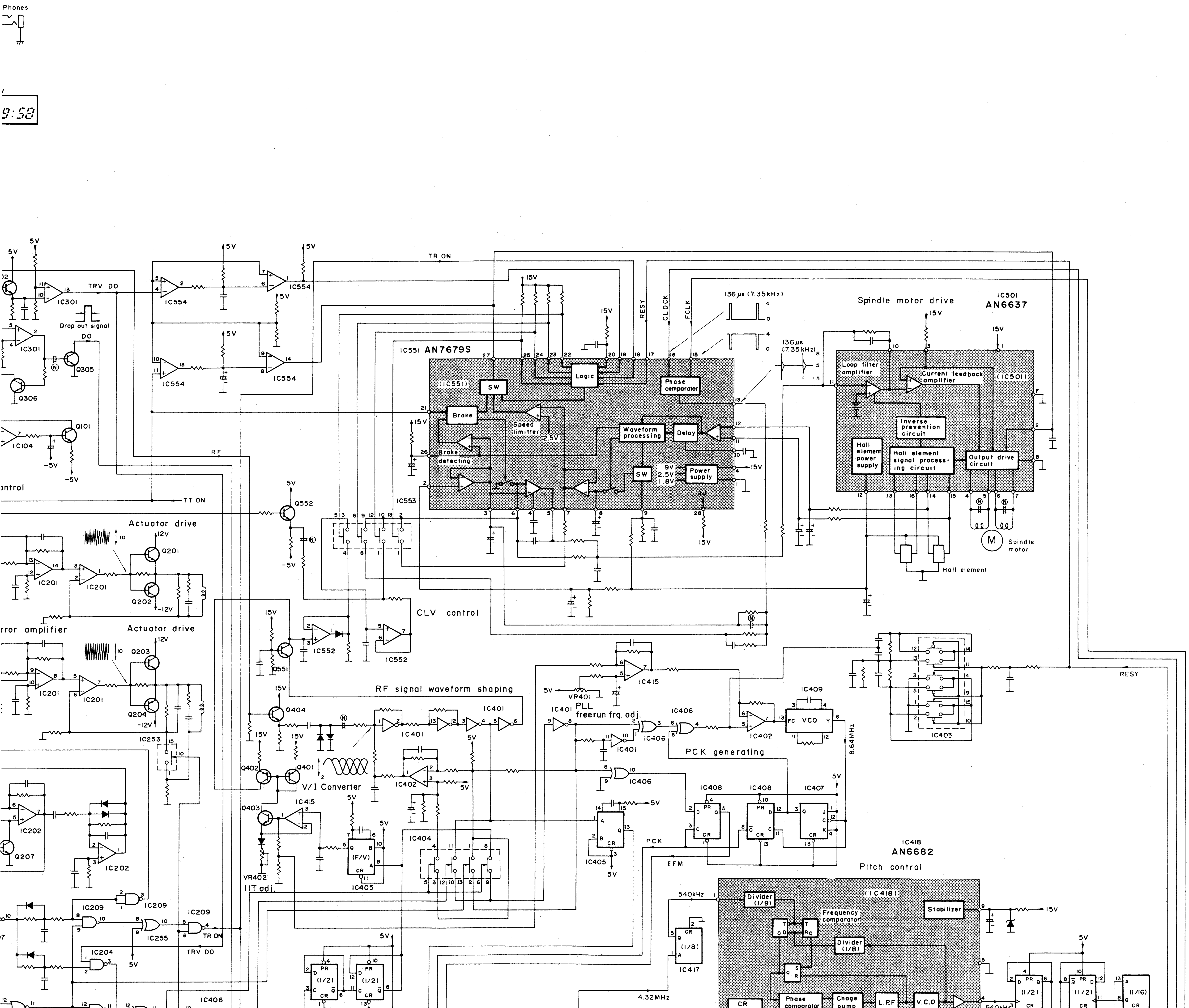
■ BLOCK DIAGRAM


Compact Disc
Laser A.P.C
Optical Actuator
Spindle Motor
Traverse Motor
Pitch Control
Quartz OSC
Error Correction
Motor Drive
CLV Control
Data Slice/Clock Regenerator
E FM Demodulator
CIRC Control
D/A Converter
4K-RAM
16K-RAM
Deglitch
Phones
Focus Control
Actuator Drive
External terminal
Synchro record terminal
Tracking Control
Actuator Drive
(L) (R)
LINE OUT
Operation Control
Display Drive
Display
Motor Drive
Loading Motor
Loading Motor Drive
Remote Control Decoder
Remote Control Sensor
Control Keys
Remote Control
1 5 10 15 20
7 49:58


Focus servo
IC101 AN7677S
Photo detector
Mixing (+)
RF detector
Delay
Comparator
S-curve detector
Control circuit
Delay
Mixing (-)
Amp.
SW
SW
Search OSC
A3+A4
A1+A2
I—V
VR103 Balance adj.
VR107 Off set adj.
VR102 Gain adj.
RF
Drop out detecting
Drop out signal
TRV DO
Laser
VR151 Power adj.
Laser power control
Focus error amplifier
Actuator drive
IC103
IC208
IC201
Q201
Q202
500mV
Tracking servo
IC102
Buffer
Mixing (-)
Compa-rator
Balance adj. VR104
VR105 Gain adj.
VR106 Off set adj.
IC253
Tracking error amplifier
Actuator drive
Q203
Q204
Tracking servo
IC204
IC554
TR ON
TT ON
RF
Q552
IC551 AN7679S
SW
Logic
Brake
Speed limitter
Brake detecting
Waveform processing
RESY
IC553
IC552
Q551
CLV control
RF signal waveform shaping
IC401
Q404
V/I Converter
IC415
VR401 PLL freerun frq. adj.
IC406



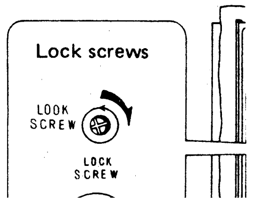
Balance adj.
VR104
5V
Tracking servo
IC204
IC205
IC251
IC255
IC202
Q207
Traverse servo
Q205
Q206
Traverse motor
VR201
Off set adj.
-15V
15V
9V
-9V
IC207
IC209
TR ON
TRV DO
DO
IC406
TRON
FWD
REV
Q602
TR ON signal processing
Q402
Q401
V/I Converter
IC402
Q403
IC415
VR402
I1T adj.
IC405
(F/V)
IC404
IC401
IC406
PCK
IC414
(1/2)
4.32MHz
S652 ON 8.64MHz
S652 OFF 8.64MHz
IC407
IC413
Refe
Operation control
TT ON
Synchro rec
Q601
IC614
Rest
End
Close
Open
(S651)
Timer
off
Auto
IC611
MN1421PCM
Sensor "on"
D661
Key switch
(IC611)
Q612
Q611
(IC612)
IC612
MN1564PCL
IC701
MN6614
Operation control and Remote control signal decoder
Motor drive
Drive
Pre amp.
Direction select
Speed designation
(IC604)
Loading motor
IC604
SVIBA6209
Memory
(IC615)
IC615
MN2114-2
External
IC702
MN2114-2
EFM Demodulator
(IC701)
TRON
PCK
EFM
RESY
MCK
FCLK
FDR1
NDR1
PWIA1
SMCK
MUTE
BLKCK
CLDCK
SUBQ
SBCK
SUBC
CIDATA
CIADR
CIWE
Address
Data
Memory
(IC702)
IC703
MN6616
Error correction
IC705
MN6615
CIRC Control
CLDCK
RESY
FCLK
(IC703)
NDR1
FDR2
FDR1
DIWE
C2DATA
C2FLAG
FLAG2
FLAG1
DIDT
MCK
FCLR
FCLK
0.46µs (2.16MHz)
(IC705)
ATSB
XT1
(LSB)
DATA
(MSB)
DGLT. L
DGLT. R
MUTE
DIA
PWIA1
SMCK
MUTE
FCLR
Memory
(IC704)
IC704
MN4316-20
Address
IC801
AN6806
D/A Converter
I/V Converter
(IC801)
SP10
IOUT
IC802
VR851
MSB adj.
MSB Correction
22.7µs (44.1kHz)
IC651
(IC651)
F.L
8
a~g
1a~5a
1G ~ 10G
Music scan
Repeat
Pause/Stop
Play
IC651
MN1430PCG
Display drive
Remote control data signal
IC1101
AN5020
Amplifier
(IC1101)
Gain adj.
R1103
T1101
Q1101
12V
3V
D1101
D1007
D1008
Q1001
Q1002
D1009
IC1001
AN6030
Remote control transmitter
Modulation
Pulse generator
11 Bit Latch
Chattering simul-depression inhibit
(IC1001)
Timing generation circuit
Key input control circuit
Battery 3V
8 ~ 13
14 ~ 21
Remote control key switch

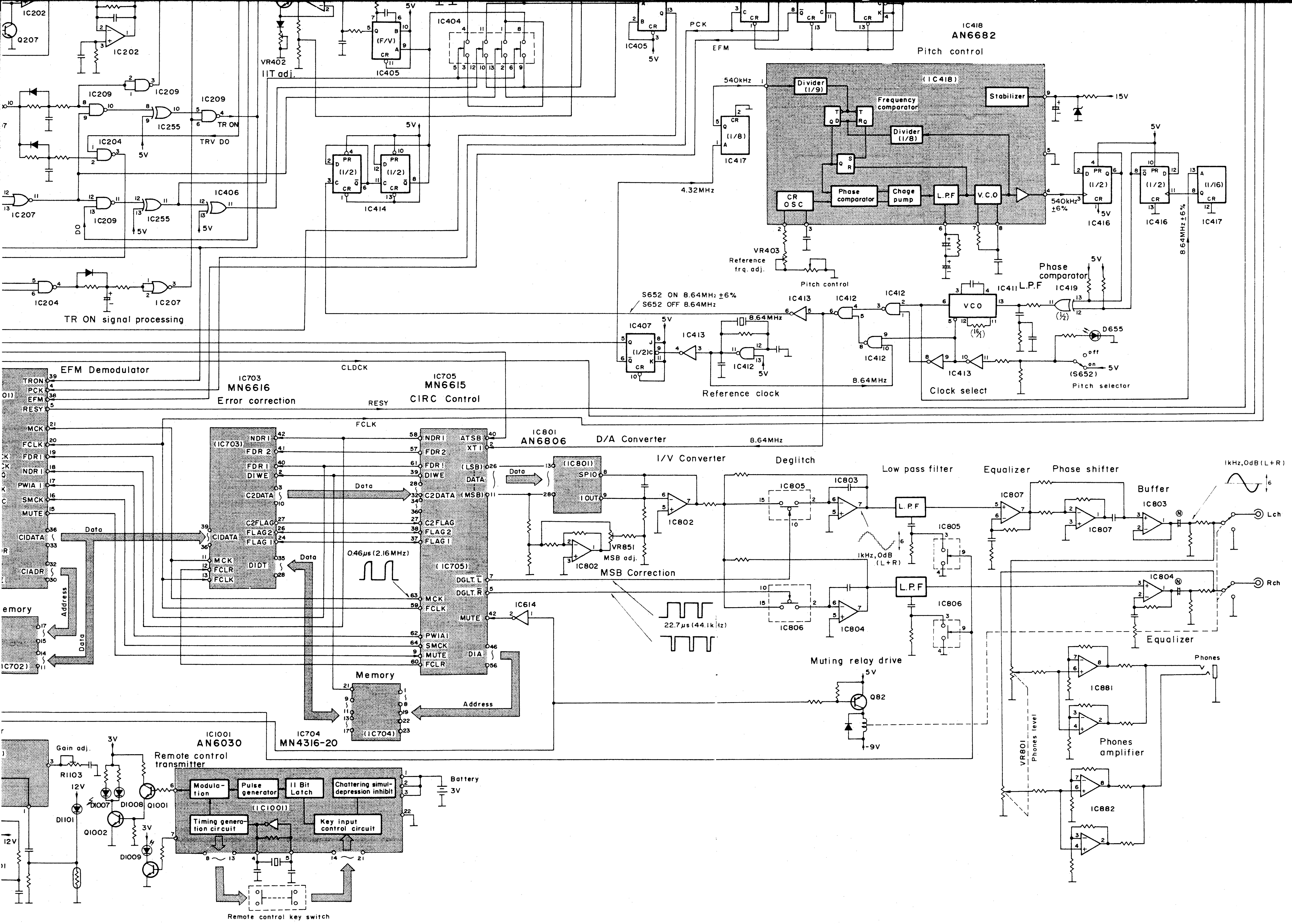

Phones
9:58
5V
TRV DO
IC301
Drop out signal
DO
Q305
Q306
IC554
TR ON
IC101
Q101
IC104
-5V
RF
TT ON
ntrol
Actuator drive
IC201
Q201
Q202
12V
-12V
rror amplifier
Q203
Q204
IC253
IC202
Q207
IC209
IC255
IC204
TR ON
TRV DO
IC406
IC551 AN7679S
(IC551)
SW
Logic
Brake
Speed limitter
2.5V
Brake detecting
Waveform processing
Delay
Phase comparator
Power supply
9V
2.5V
1.8V
15V
RESY
CLDCK
FCLK
136μs (7.35kHz)
IC553
Q552
CLV control
IC552
Q551
RF signal waveform shaping
IC401
Q404
Q402
Q401
Q403
V/I Converter
IC402
IC415
VR402
IIT adj.
IC405
(F/V)
IC404
IC501
AN6637
Spindle motor drive
(IC501)
Loop filter amplifier
Current feedback amplifier
Inverse prevention circuit
Hall element power supply
Hall element signal processing circuit
Output drive circuit
Spindle motor
Hall element
IC403
RESY
5V
VR401
PLL
freerun frq. adj.
IC406
IC409
VCO
FC
8.64MHz
PCK generating
IC408
IC407
PCK
EFM
IC418
AN6682
Pitch control
540kHz
IC417
(1/8)
4.32MHz
Divider (1/9)
Frequency comparator
Divider (1/8)
Stabilizer
Phase comparator
Chage pump
L.PF
V.C.O
(1/2)
(1/16)
PR
CR

SL-P8

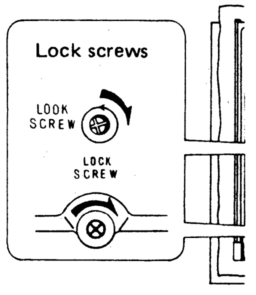
■ PACKING

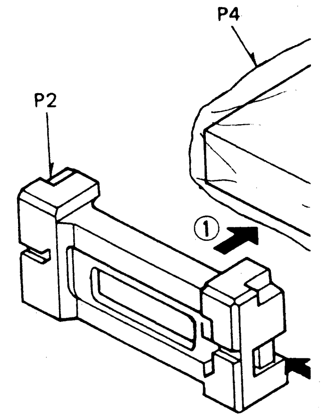
1. Put a soft cloth u
   it from scrathes.
2. Turn the lock shaft
3. Turn the lock scre
   clockwise.


Lock screws
LOCK SCREW
LOCK SCREW

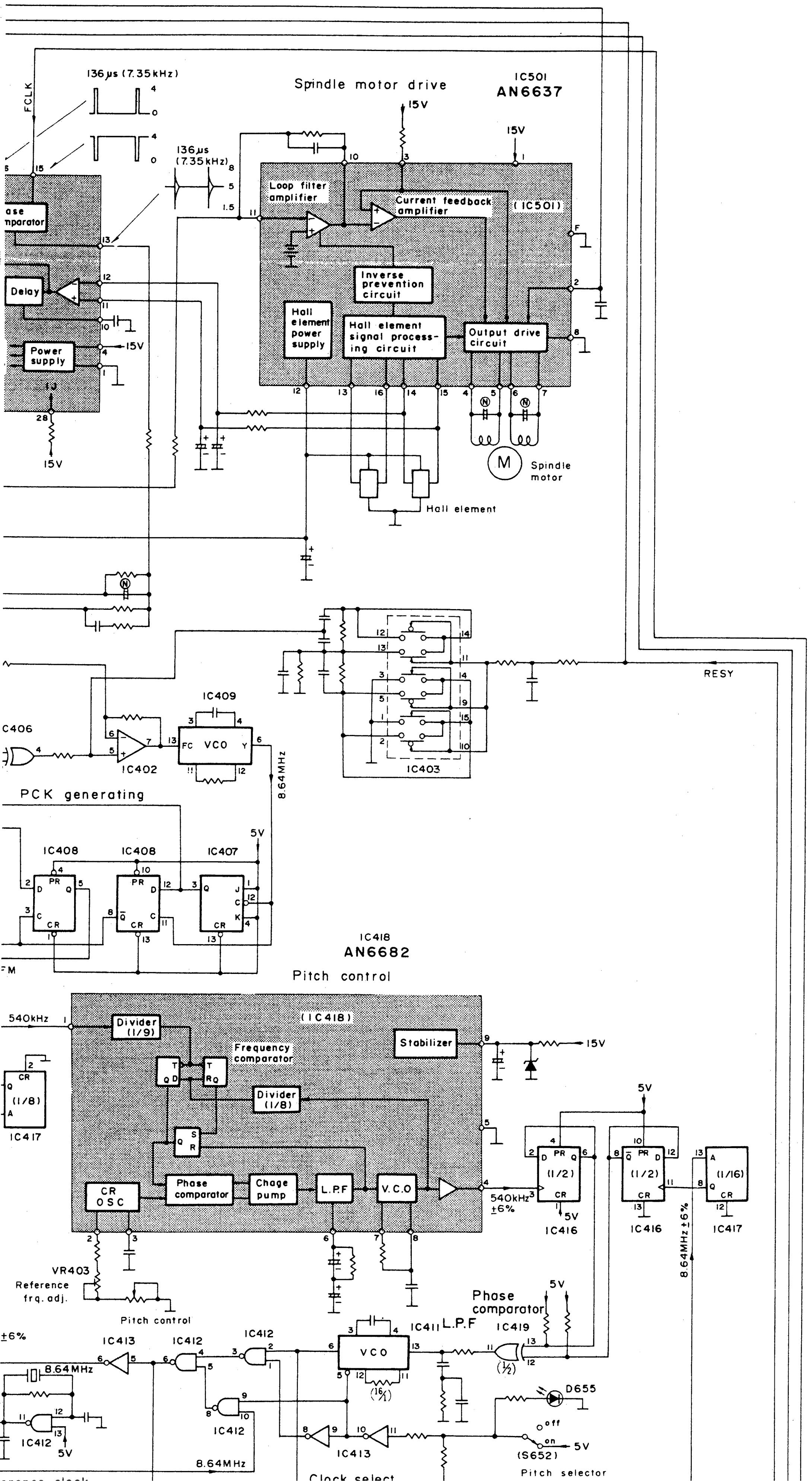

IC202
Q207
IC209
IC204
IC255
TR ON
TRV DO
IC207
IC406
IC405
(F/V)
IC404
VR402
11T adj.
IC414
(1/2)
TR ON signal processing
EFM Demodulator
TRON
PCK
EFM
RESY
MCK
FCLK
FDR1
NDR1
PWIA1
SMCK
MUTE
CIDATA
CIADR
Memory
Address
Data
IC702
IC703
MN6616
Error correction
IC705
MN6615
CIRC Control
CLDCK
RESY
FCLK
IC704
MN4316-20
Memory
0.46μs (2.16MHz)
IC418
AN6682
Pitch control
Divider (1/9)
Frequency comparator
Stabilizer
Divider (1/8)
CR OSC
Phase comparator
Chage pump
L.P.F
V.C.O
540kHz
4.32MHz
540kHz ±6%
IC416
IC417
(1/16)
8.64MHz ±6%
VR403
Reference frq. adj.
Pitch control
S652 ON 8.64MHz ±6%
S652 OFF 8.64MHz
IC407
IC413
IC412
IC411 L.P.F
VCO
Phase comparator
IC419
D655
(S652)
Pitch selector
Reference clock
Clock select
8.64MHz
IC801
AN6806
D/A Converter
I/V Converter
Deglitch
Low pass filter
Equalizer
Phase shifter
Buffer
IC802
VR851
MSB adj.
MSB Correction
IC805
IC803
IC806
IC804
IC807
1kHz, 0dB (L+R)
Lch
Rch
22.7μs (44.1kHz)
IC614
Muting relay drive
Q82
5V
-9V
VR801
Phones level
Phones
IC881
IC882
Phones amplifier
Equalizer
IC1001
AN6030
Remote control transmitter
Gain adj.
R1103
Modulation
Pulse generator
11 Bit Latch
Chattering simulation depression inhibit
Timing generation circuit
Key input control circuit
Battery 3V
D1007
D1008
Q1001
Q1002
D1101
D1009
Remote control key switch

1. Put a soft cloth u
it from scrathes.
2. Turn the lock shaft
3. Turn the lock scre
clockwise.


Lock screws
LOOK SCREW
LOCK SCREW



4. Plase the unit (w
illustrated.
5. Fold the flaps ac
6. Seal the top with a
* Use gum tape
50mm wide at
7. For the edges, fi
then flap "b", ar
staple only flap
staple)

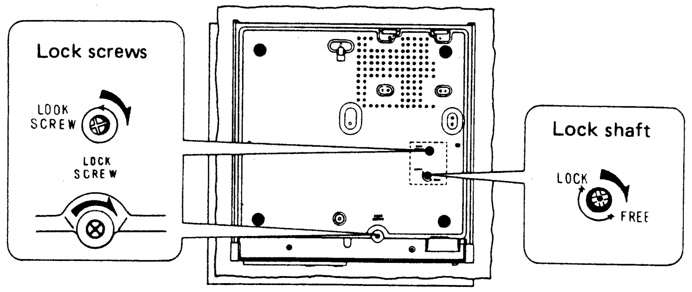


FCLK
136μs (7.35kHz)
Spindle motor drive
IC501
AN6637
15V
Loop filter amplifier
Current feedback amplifier
(IC501)
Inverse prevention circuit
Hall element power supply
Hall element signal processing circuit
Output drive circuit
Spindle motor
Hall element
Delay
Power supply
IC406
IC409
VCO
IC402
8.64MHz
IC403
RESY
PCK generating
IC408
IC408
IC407
5V
IC418
AN6682
Pitch control
540kHz
Divider (1/9)
(IC418)
Frequency comparator
Stabilizer
Divider (1/8)
Phase comparator
Chage pump
L.P.F
V.C.O
CR OSC
IC417
(1/8)
IC416
(1/2)
540kHz ±6%
8.64MHz ±6%
(1/16)
VR403
Reference frq. adj.
Pitch control
Phase comparator
IC413
IC412
IC411 L.P.F
IC419
8.64MHz
D655
off
on
(S652)
Pitch selector
Clock select

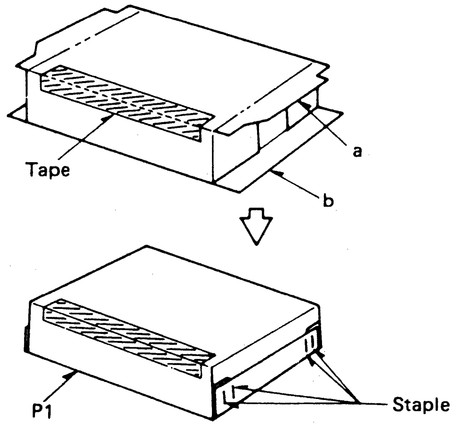
SL-P8

■ PACKING

1. Put a soft cloth under the unit to protect it from scrathes.
2. Turn the lock shaft 180° clockwise.
3. Turn the lock screws (about 5 to 6 times) clockwise.

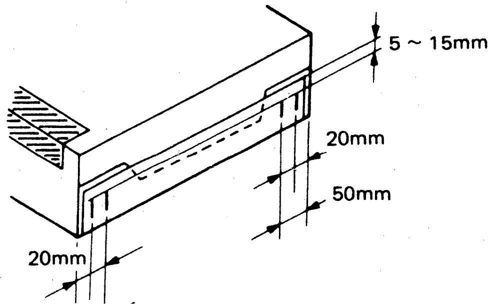


Lock screws
LOOK SCREW
LOCK SCREW
Lock shaft
LOCK
FREE

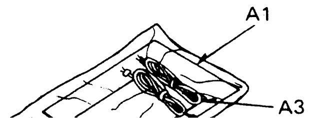


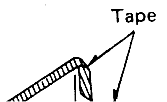
Tape
a
b
P1
Staple

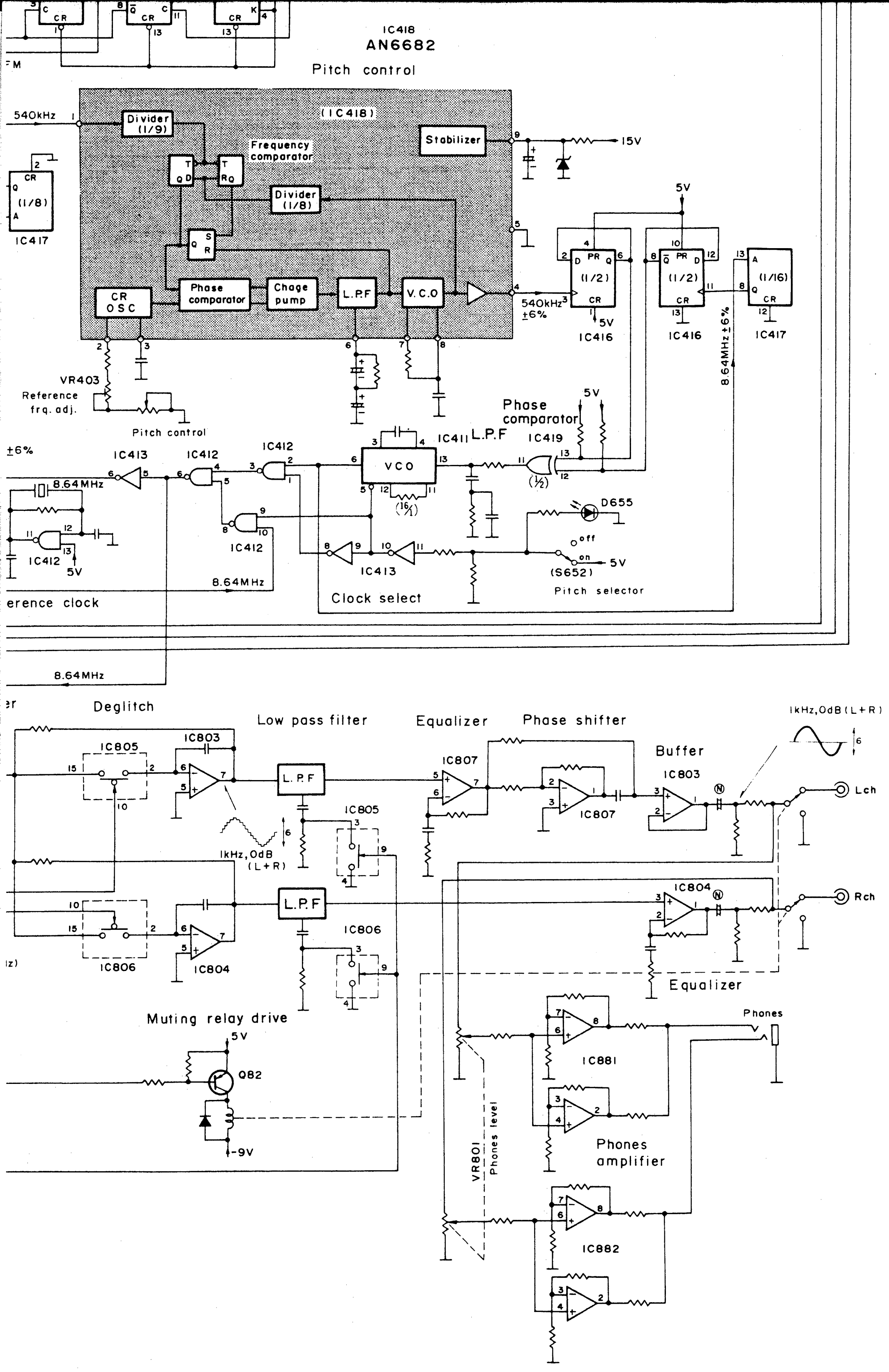
* Stapling positions are shown below.



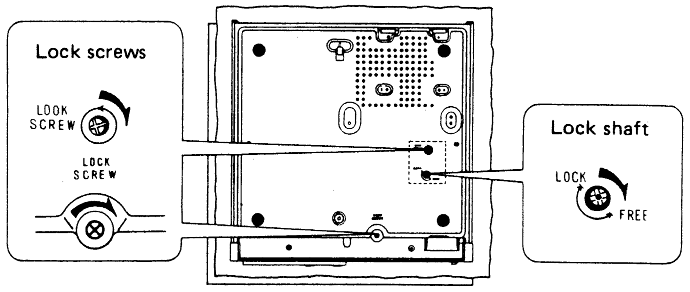
5 ~ 15mm
20mm
50mm
20mm

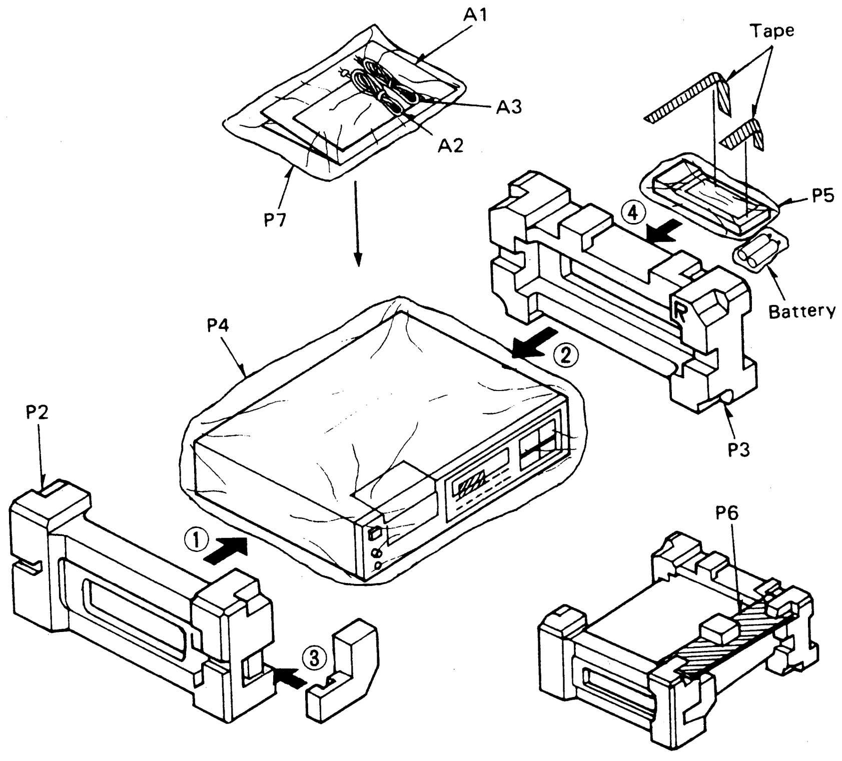




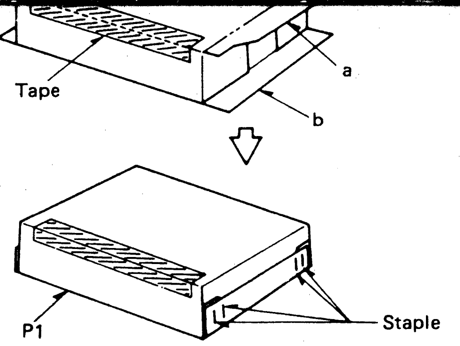

IC418
AN6682
Pitch control
540kHz
(IC418)
Divider (1/9)
Frequency comparator
Stabilizer
15V
Divider (1/8)
CR (1/8)
IC417
CR OSC
Phase comparator
Chage pump
L.P.F
V.C.O
5V
PR
(1/2)
CR
540kHz ±6%
IC416
(1/16)
IC417
8.64MHz±6%
VR403
Reference frq. adj.
Pitch control
Phase comparator
±6%
IC413
IC412
IC411 L.P.F
IC419
VCO
(16/1)
(1/2)
8.64MHz
D655
off
on
5V
(S652)
Pitch selector
IC412
8.64MHz
Clock select
erence clock
8.64MHz
Deglitch
Low pass filter
Equalizer
Phase shifter
1kHz, 0dB (L+R)
Buffer
IC805
IC803
L.P.F
IC807
IC803
Lch
IC805
1kHz, 0dB (L+R)
IC804
Rch
L.P.F
IC806
IC806
IC804
Equalizer
Muting relay drive
5V
Q82
-9V
Phones
IC881
VR801 Phones level
Phones amplifier
IC882

it from scrathes.
2. Turn the lock shaft 180° clockwise.
3. Turn the lock screws (about 5 to 6 times) clockwise.

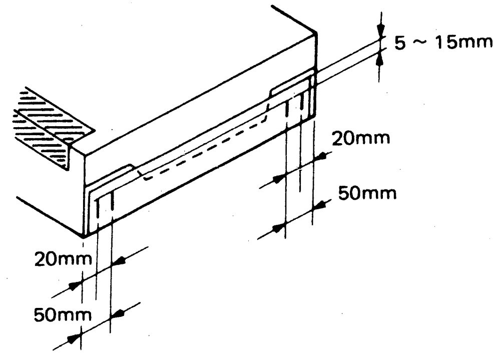

Lock screws
LOCK SCREW
LOCK SCREW
Lock shaft
LOCK
FREE


A1
A3
A2
P7
Tape
P5
④
Battery
P4
②
P3
P2
①
③
P6

4. Plase the unit (with cushions attached, as illustrated.
5. Fold the flaps according to the line marks.
6. Seal the top with adhesive tape.
   - * Use gum tape or adhesive cloth tape of 50mm wide at least.
7. For the edges, first fold the flap "a" and then flap "b", and staple. Remember to staple only flap "b". (Use 15 or 16mm staple)


Tape
a
b
P1
Staple

* Stapling positions are shown below.

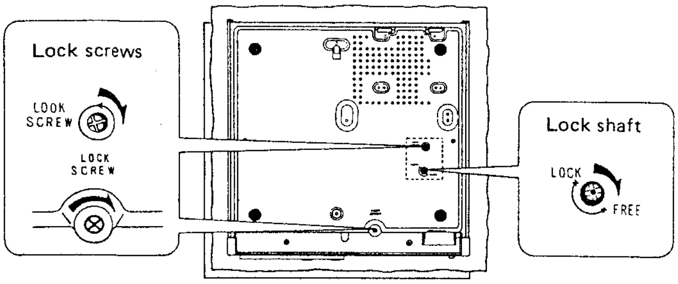

5 ~ 15mm
20mm
50mm
20mm
50mm

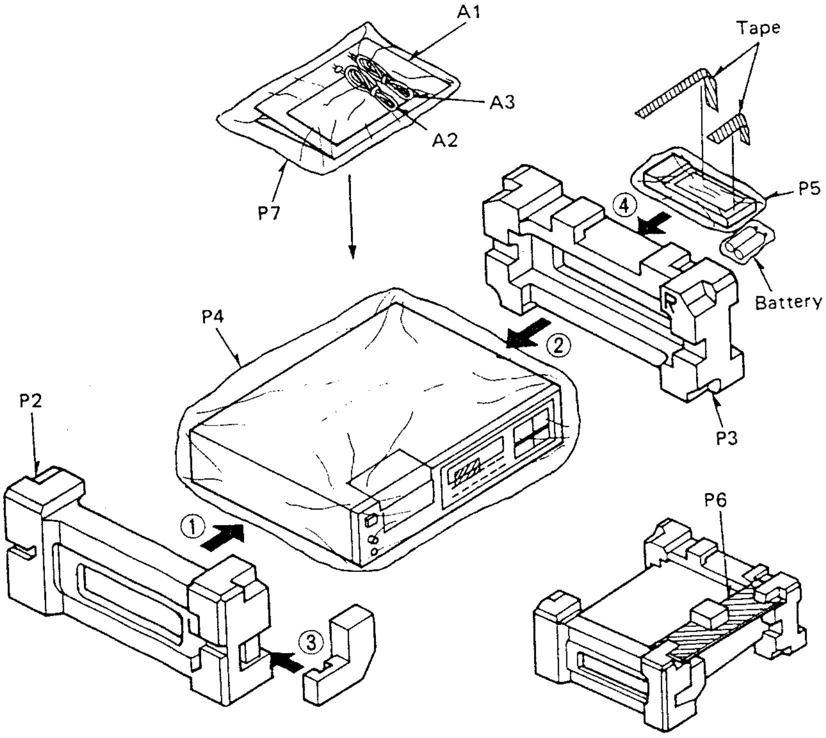
Ref. No.	Part No.	Description
ACCESSORIES		
A1 (EK)	SRNU008G01	Instruction Book (1)
A1 (EI)	SRNU008I01	Instruction Book (1)
A1 (EG, EF XA, XL XM)	SRNU008X01	Instruction Book (1)
A1 (E, EB EH, EC)	SRNU008S01	Instruction Book (1)
A1 (PA, PE PC)	SRNU008P01	Instruction Book (1)
A2 (EK) ⚠	SFDAC05G02	AC Cord (1)
A2 (XL) ⚠	SFDAC05L01	AC Cord (1)
A2 (XA, XM) ⚠	SFDAC05X01	AC Cord (1)
A2 (PA, PE PC) ⚠	SFDAC05N01	AC Cord (1)
A2 (Other Areas) ⚠	SFDAC05E02	AC Cord (1)
A3	SFDHC05N01	Pin Plug Cord (1)
A4 (XA, XM) ⚠	SFDKI19118	2Pin Plug (1)
A5 (PA, PE PC) ⚠	QJP0603S	Plug (1)
A6	UM-4NE-2P	Battery (2)
PACKING PARTS		
P1 (EF) ○	SRHP008C01	Carton Box(Silver) (1)
P1 (EF) Ⓚ	SRHP008C51	Carton Box(Black) (1)
P1 (Other Areas) ○	SRHP008M01	Carton Box(Silver) (1)
P1 (Other Areas) Ⓚ	SRHP008M51	Carton Box(Black) (1)
P2	SRHH008N01	Pad,Left Side (1)
P3	SRHH008N02	Pad,Right Side (1)
P4	SFYH60×60	Polyethlene Bag (1)
P5	SFYF09A21	Polyethlene Bag (1)
P6	SRHD008N01	Pad,Cabinet (1)
P7	SFYF23A35	Polyethlene Bag, Accessories (1)

Printed in Japan
831010200 Ⓗ AM/YW

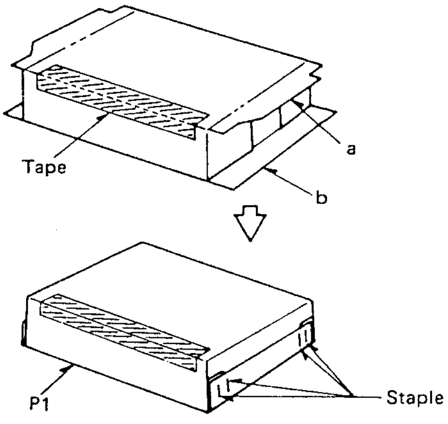
■ PACKING

1. Put a soft cloth under the unit to protect it from scrathes.
2. Turn the lock shaft 180° clockwise.
3. Turn the lock screws (about 5 to 6 times) clockwise.

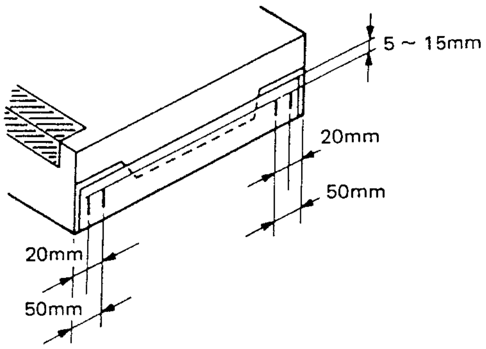




4. Plase the unit (with cushions attached, as illustrated.
5. Fold the flaps according to the line marks.
6. Seal the top with adhesive tape.
   * Use gum tape or adhesive cloth tape of 50mm wide at least.
7. For the edges, first fold the flap "a" and then flap "b", and staple. Remember to staple only flap "b". (Use 15 or 16mm staple)



* Stapling positions are shown below.



Ref. No.	Part No.	Description	
ACCESSORIES			
A1 (EK)	SRNU008G01	Instruction Book	(1)
A1 (EI)	SRNU008I01	Instruction Book	(1)
A1 [EG, EF XA, XL XM]	SRNU008X01	Instruction Book	(1)
A1 [E, EB EH, EC]	SRNU008S01	Instruction Book	(1)
A1 [PA, PE PC]	SRNU008P01	Instruction Book	(1)
A2 (EK) ⚠	SFDAC05G02	AC Cord	(1)
A2 (XL) ⚠	SFDAC05L01	AC Cord	(1)
A2 (XA, XM) ⚠	SFDAC05X01	AC Cord	(1)
A2 [PA, PE PC] ⚠	SFDAC05N01	AC Cord	(1)
A2 [Other Areas] ⚠	SFDAC05E02	AC Cord	(1)
A3	SFDHC05N01	Pin Plug Cord	(1)
A4 (XA, XM) ⚠	SFDKI19118	2Pin Plug	(1)
A5 [PA, PE PC] ⚠	QJP0603S	Plug	(1)
A6	UM-4NE-2P	Battery	(2)
PACKING PARTS			
P1 (EF) ○	SRHP008C01	Carton Box(Silver)	(1)
P1 (EF) Ⓚ	SRHP008C51	Carton Box(Black)	(1)
P1 [Other Areas] ○	SRHP008M01	Carton Box(Silver)	(1)
P1 [Other Areas] Ⓚ	SRHP008M51	Carton Box(Black)	(1)
P2	SRHH008N01	Pad,Left Side	(1)
P3	SRHH008N02	Pad,Right Side	(1)
P4	SFYH60×60	Polyethlene Bag	(1)
P5	SFYF09A21	Polyethlene Bag	(1)
P6	SRHD008N01	Pad,Cabinet	(1)
P7	SFYF23A35	Polyethlene Bag, Accessories	(1)

Printed in Japan
831010200 Ⓗ AM/YW

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Technical Guide

VOL. 1

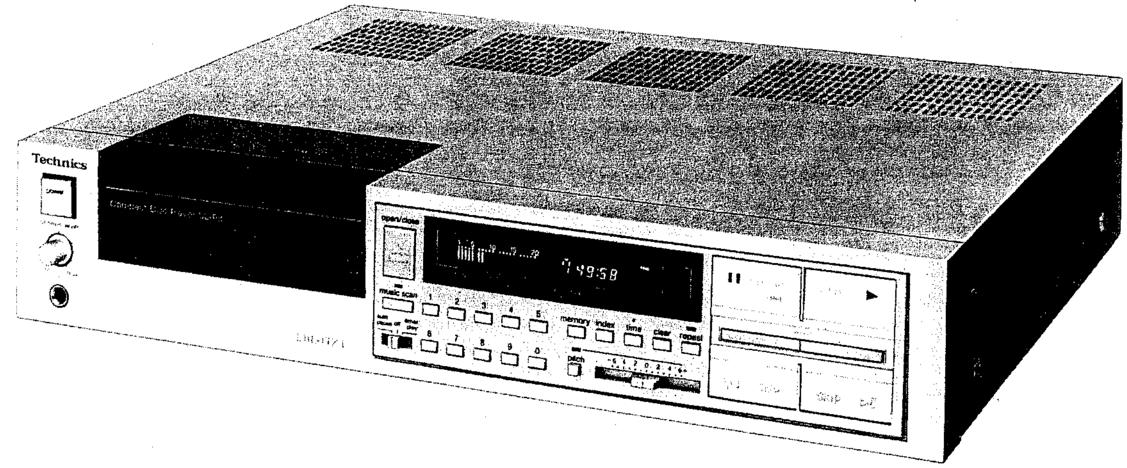
CIRCUIT DESCRIPTIONS

Compact Disc Player

SL-P8

COMPACT disc DIGITAL AUDIO

DIGITAL


Technics
open/close
music scan
1
2
3
4
5
memory
index
time
clear
repeat
6
7
8
9
0
pitch

Technics

MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
DISCPLAYER DIVISION, SERVICE GROUP.

FOREWORD

This textbook is intended to be used for seminars and self-studies in combination with the textbook of SL-P7. Therefore, those common to SL-P7 are omitted:

Accordingly, main differences from SL-P7 are involved.

1. Remote control system.
2. Expanded function of operation control.
3. Pitch control.
4. Expansion of display function.

These circuits are described in 4 chapters, and other related circuits are omitted. So, refer to the textbooks of SL-P7 circuit.

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1. Remote-control System

In SL-P8, PLAY, STOP and other operations can be controlled by use of an infrared remote controller. However, remote control is not possible for power ON/OFF, disc tray OPEN/CLOSE, pitch ON/OFF, AUTO PAUSE and TIMER PLAY.

The transmitter/receiver unit of this remote-control system is nearly the same as for SH-R800, and so is the receiver lamp of the receiver unit.

1-1. Remote-control transmission and reception

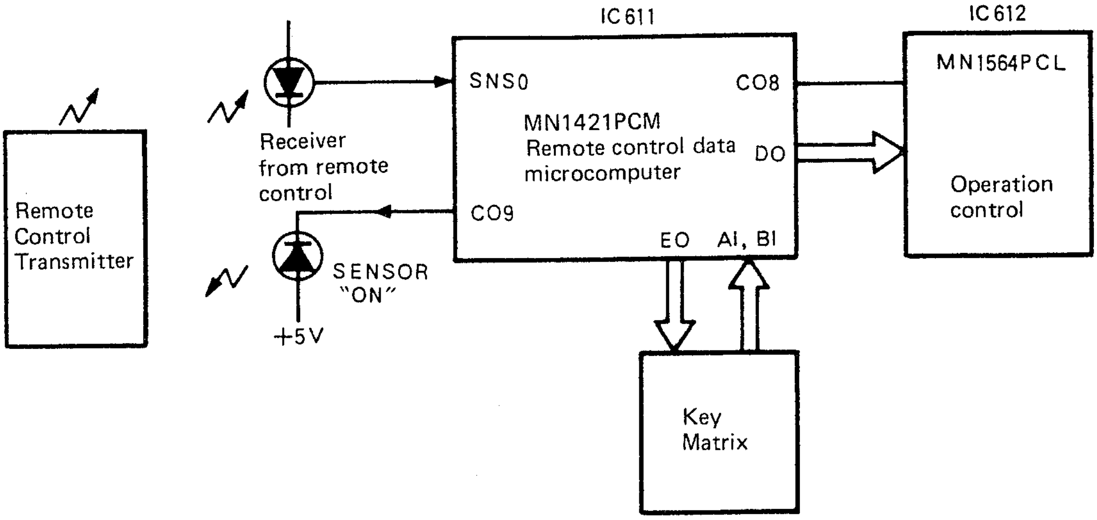

IC611
IC612
SNS0
CO8
MN1421PCM
Remote control data microcomputer
DO
CO9
EO
AI, BI
MN1564PCL
Operation control
Receiver from remote control
SENSOR "ON"
+5V
Remote Control Transmitter
Key Matrix

Fig. 1 Block diagram

1-2. Remote-control transmitter/receiver

The quartz oscillator generates 400 kHz frequency in X001, and performs AM demodulation of 36.7 kHz.

Output signal is a serial signal shown below. With a button switch of the remote-control system continuously depressed, a serial signal is generated for 65.5 ms, followed by an interval of 39.3 ms, and again a serial signal is generated.

Therefore, the indicator of remote control system blinks in the order of signal and interval.

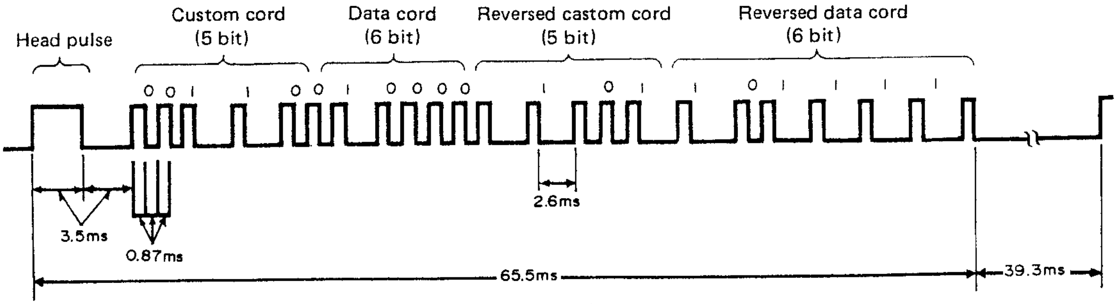

Head pulse
Custom cord (5 bit)
Data cord (6 bit)
Reversed castom cord (5 bit)
Reversed data cord (6 bit)
0 0 1 1 0 0 1 0 0 0 0 1 0 1 1 0 1 1 1 1
3.5ms
0.87ms
2.6ms
65.5ms
39.3ms

Fig. 2 Serial signal ⏮ SKIP

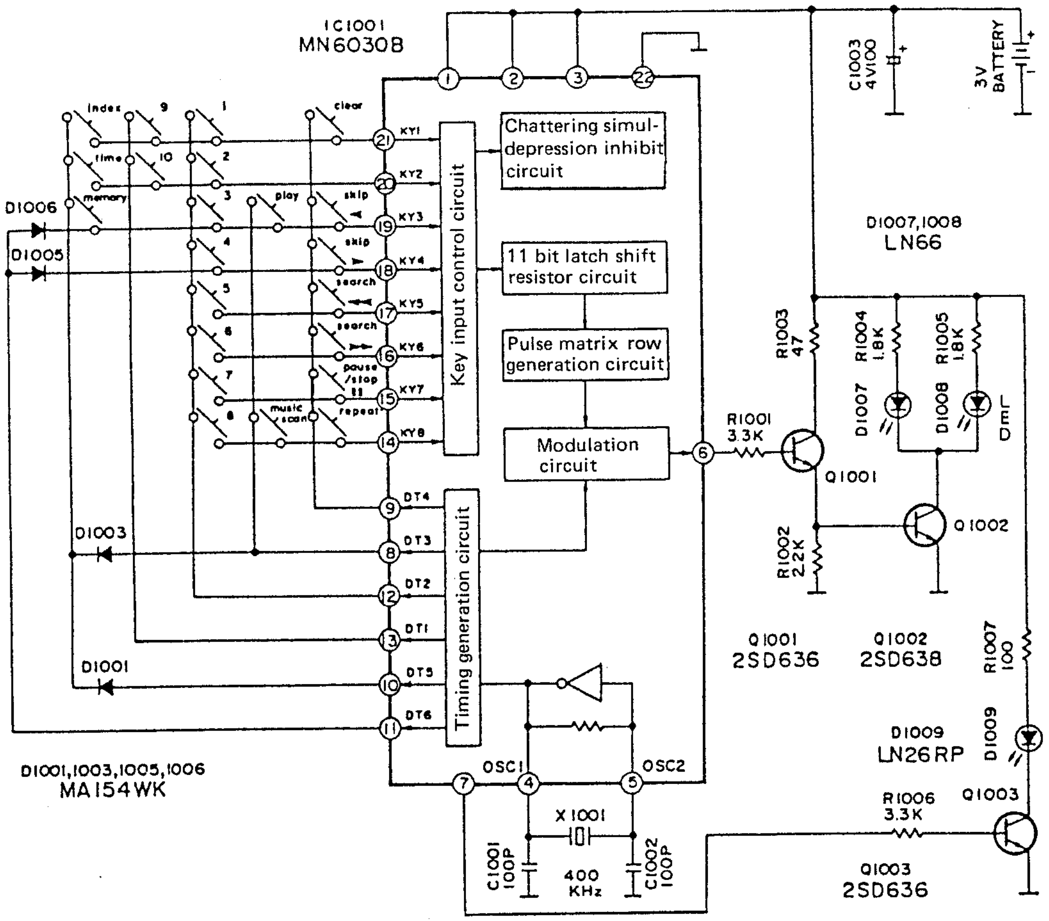

IC1001
MN6030B
index
9
1
clear
time
10
2
memory
3
play
skip
D1006
4
skip
D1005
5
search
6
search
7
pause /stop
8
music scan
repeat
KY1
KY2
KY3
KY4
KY5
KY6
KY7
KY8
Key input control circuit
Chattering simul-depression inhibit circuit
11 bit latch shift resistor circuit
Pulse matrix row generation circuit
Modulation circuit
Timing generation circuit
DT4
DT3
DT2
DT1
DT5
DT6
D1003
D1001
D1001,1003,1005,1006
MA154WK
OSC1
OSC2
X1001
400 KHz
C1001 100P
C1002 100P
C1003 4V100
3V BATTERY
D1007,1008
LN66
R1003 47
R1004 1.8K
R1005 1.8K
D1007
D1008
Dmf
R1001 3.3K
Q1001
Q1002
R1002 2.2K
Q1001 2SD636
Q1002 2SD638
R1007 100
D1009
LN26RP
D1009
R1006 3.3K
Q1003
Q1003 2SD636

Fig. 3 Transmitter circuit diagram

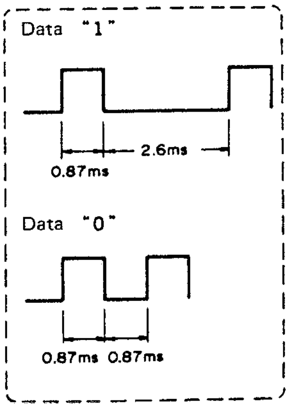

Data "1"
2.6ms
0.87ms
Data "0"
0.87ms
0.87ms

Fig. 4 "1" and "0" of serial signal

Control button	Data cord	Control button	Data cord
Clear	0 0 0 0 0 0	4	1 1 0 0 1 0
▶|	1 1 0 0 0 0	5	0 0 1 0 1 0
◀◀	0 0 1 0 0 0	6	1 0 1 0 1 0
▶▶	1 0 1 0 0 0	7	0 1 1 0 1 0
||	0 1 1 0 0 0	8	1 1 1 0 1 0
Repeat	1 1 1 0 0 0	9	0 0 0 1 1 0
▶ Play	0 1 0 1 0 0	0	1 0 0 1 1 0
SCAN	1 1 1 1 0 0	INDEX	0 0 0 1 0 1
1	0 0 0 0 1 0	TIME	1 0 0 1 0 1
2	1 0 0 0 1 0	MEMORY	0 1 0 1 0 1
3	0 1 0 0 1 0	|◀ SKIP	0 1 0 0 0 0

Table 1 Serial signal data

(In transmitter, oscilloscope can be checked by 01001 emitter and IC611 terminal 21 of the set.)

1-3. Remote-control receiver amplifier

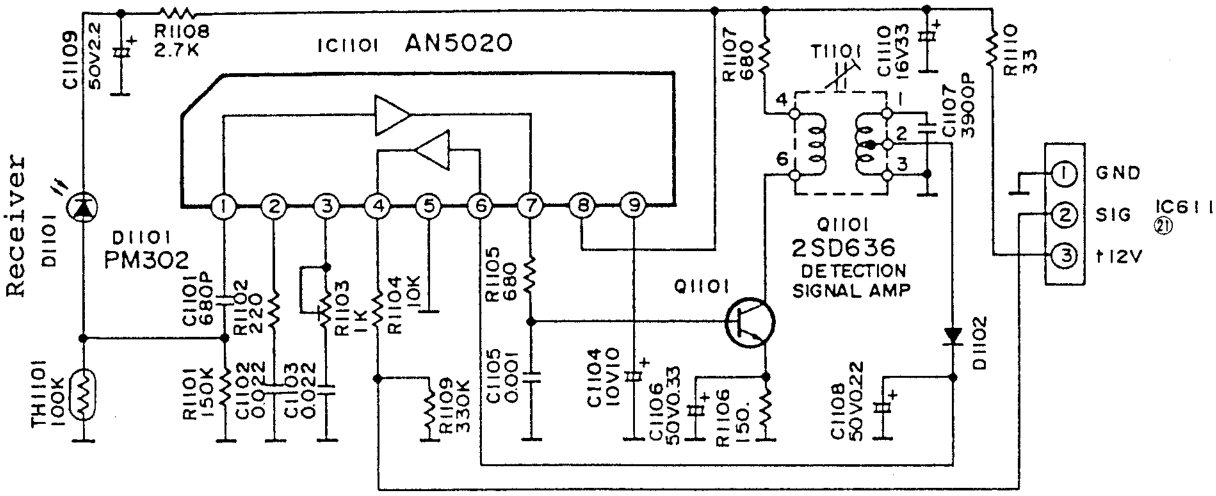

Receiver
D1101
C1109
50V2.2
R1108
2.7K
IC1101 AN5020
D1101
PM302
C1101
680P
R1102
220
R1103
1K
R1104
10K
R1105
680
Q1101
R1107
680
T1101
C1110
16V33
C1107
3900P
R1110
33
1
2
3
4
5
6
7
8
9
GND
SIG
+12V
IC611
㉑
Q1101
2SD636
DETECTION
SIGNAL AMP
D1102
TH1101
100K
R1101
150K
C1102
0.022
C1103
0.022
R1109
330K
C1105
0.001
C1104
10V10
C1106
50V0.33
R1106
150.
C1108
50V0.22

Fig. 5 Receiver amp circuit

This circuit eliminates AM from the optical signal converted into AM of the remote controller, and puts only serial signal into IC611 terminal 21 of microcomputer.

Operation

1. Optical signal of remote controller is converted into electrical signal by photo diode D1101 (1). It is put in IC1101 (1) of receiver amp, and put out to terminal (7).

2. It is then amplified by Q1101; tuned to 36.7 kHz by T1101; subjected to AM detection at D1102; and amplified by optical amplifier. Then the output is put into IC611 (21) as serial signal.

3. The serial signal is same in phase as the emitter waveform (with AM) of Q1001 of remote-control transmitter.

1-4. Operation of microcomputer for remot-control decode

(MN1421PCM)

Name of port	Function	Name of port	Function
AI port	Key scan input	DO port	Data output to operation control } opecon
BI port	〃 〃	CO port	
EO port	Key scan output	CO8	
Sensor input SNSO	Remote control signal input	CO9	Light up the sensor during redeiving from remote control

MN1421 PCM terminal diagram

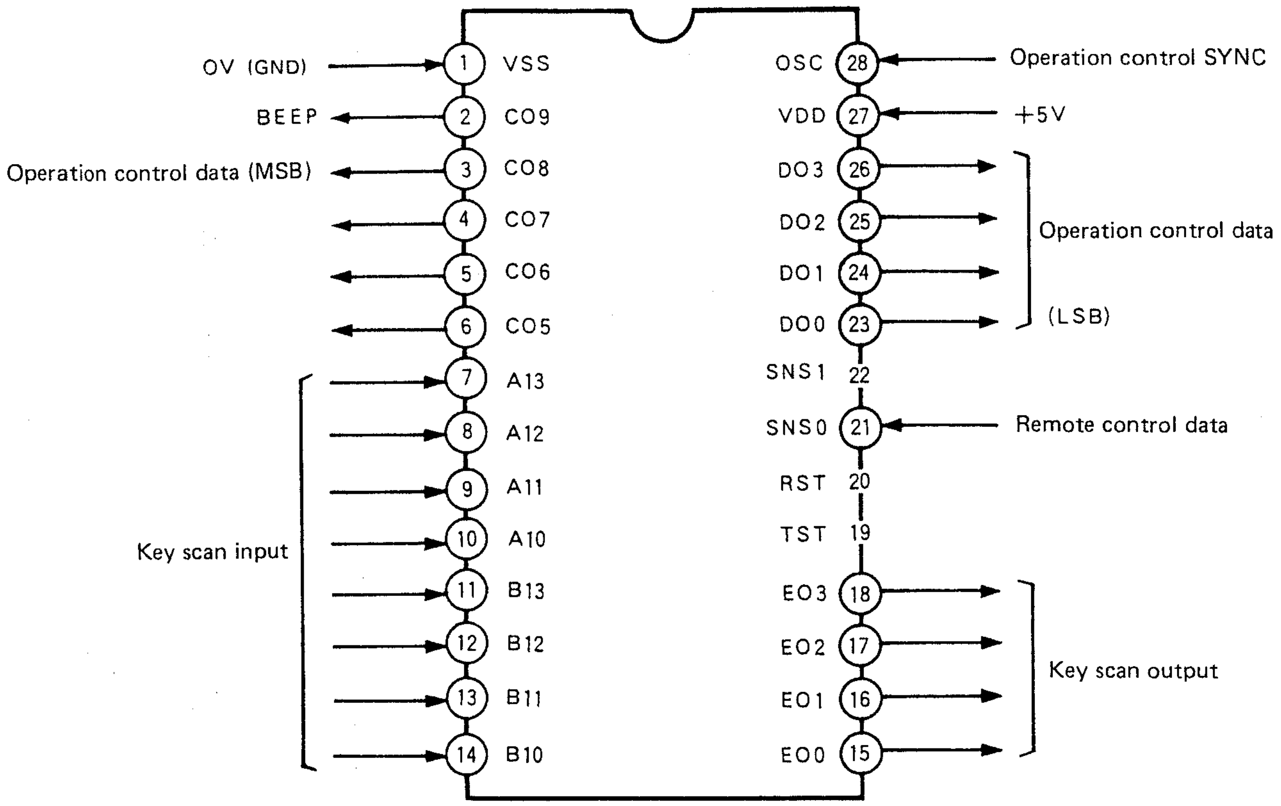

OV (GND)
BEEP
Operation control data (MSB)
Key scan input
1 VSS
2 CO9
3 CO8
4 CO7
5 CO6
6 CO5
7 A13
8 A12
9 A11
10 A10
11 B13
12 B12
13 B11
14 B10
OSC 28
VDD 27
DO3 26
DO2 25
DO1 24
DO0 23
SNS1 22
SNS0 21
RST 20
TST 19
EO3 18
EO2 17
EO1 16
EO0 15
Operation control SYNC
+5V
Operation control data
(LSB)
Remote control data
Key scan output

Fig. 6 MN1421 PCM terminal diagram

Output of MN1421 PCM

When each of remote control and key matrix is depressed, 5-bit output obtained from EO port C08 is obtained as follows. Then it is put in P01 - P03, PIO of operation controller.

Table 2 Key matrix remote control outputs

Function	CO8	DO3	DO2	DO1	DO0	Function	CO8	DO3	DO2	DO1	DO0
Clear	0	0	0	0	1	2	1	0	0	1	1
◀ Skip	0	0	0	1	0	3	1	0	1	0	0
▶ Skip	0	0	0	1	1	4	1	0	1	0	1
◀◀Search	0	0	1	0	0	5	1	0	1	1	0
▶▶Search	0	0	1	0	1	6	1	0	1	1	1
Pause/Stop	0	0	1	1	0	7	1	1	0	0	0
Repeat	0	0	1	1	1	8	1	1	0	0	1
▶Play	0	1	0	1	0	9	1	1	0	1	0
Open/Close	0	1	1	1	0	Index	1	1	1	0	1
Music scan	0	1	1	1	1	Timer	1	1	1	1	0
0	0	0	0	0	1	Memory	1	1	1	1	1
1	1	0	0	1	0						

L or H while key is depressed

1-5. Key matrix circuit

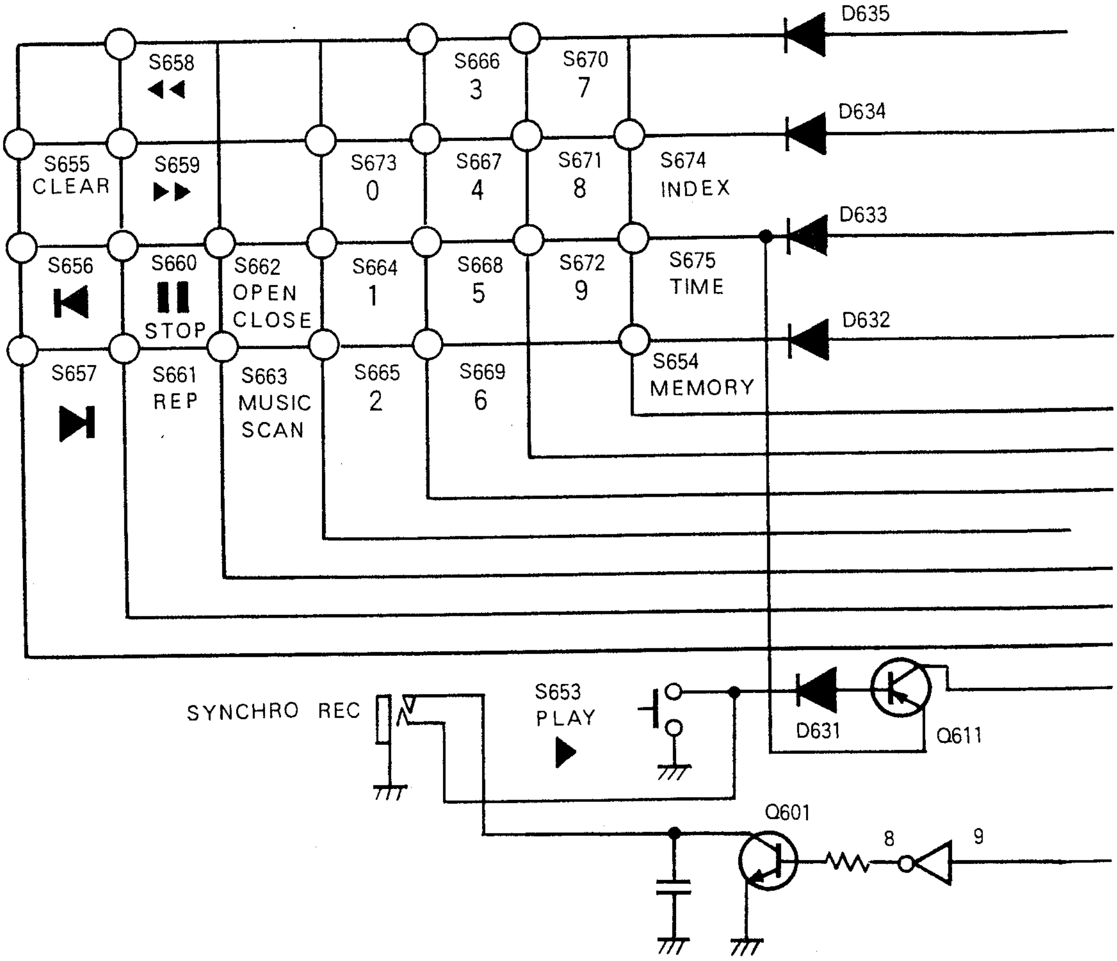
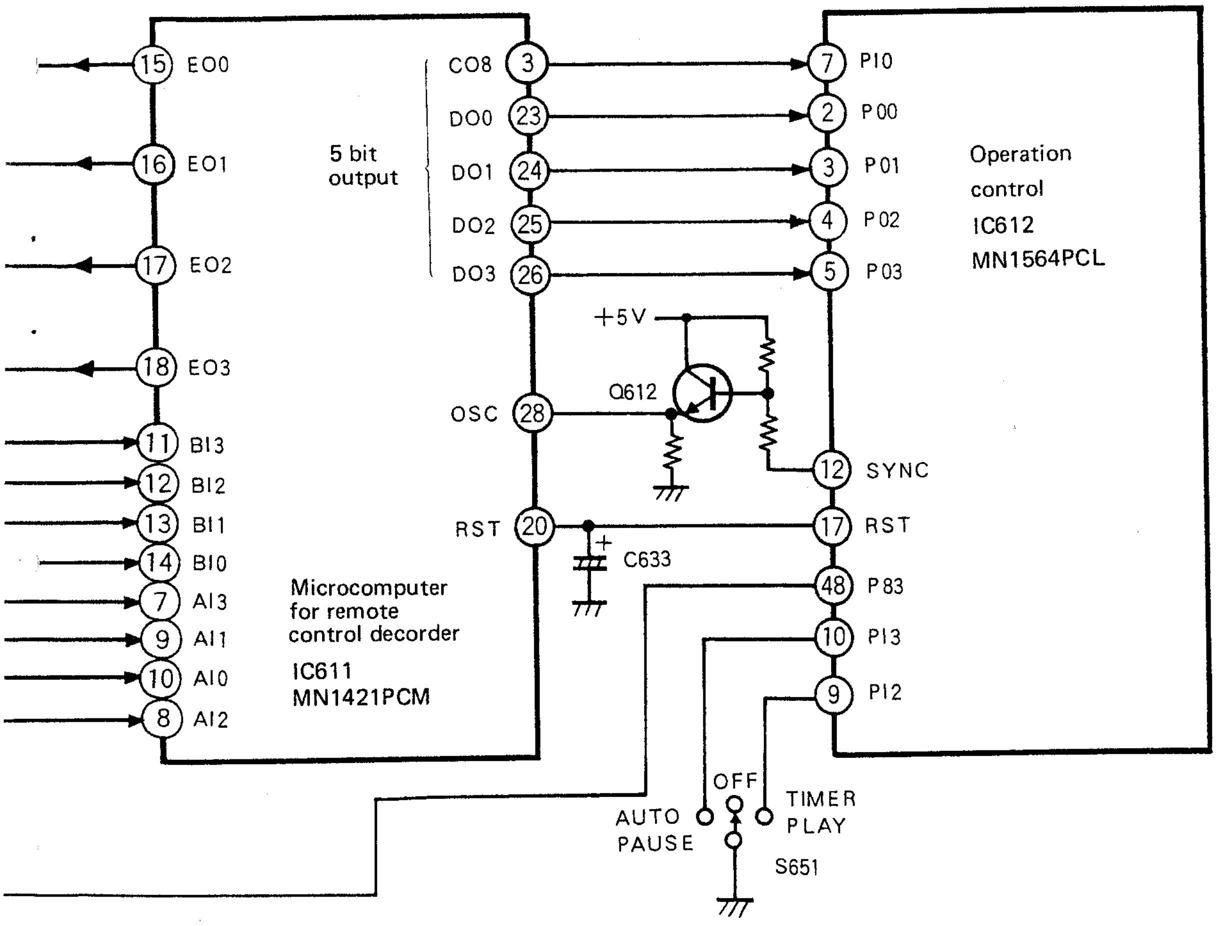

D635
D634
D633
D632
S658
◀◀
S666
3
S670
7
S655
CLEAR
S659
▶▶
S673
0
S667
4
S671
8
S674
INDEX
S656
S660
STOP
S662
OPEN
CLOSE
S664
1
S668
5
S672
9
S675
TIME
S657
S661
REP
S663
MUSIC
SCAN
S665
2
S669
6
S654
MEMORY
SYNCHRO REC
S653
PLAY
D631
Q611
Q601
8
9

Fig. 7 Key matrix circuit

Configuration of the circuit

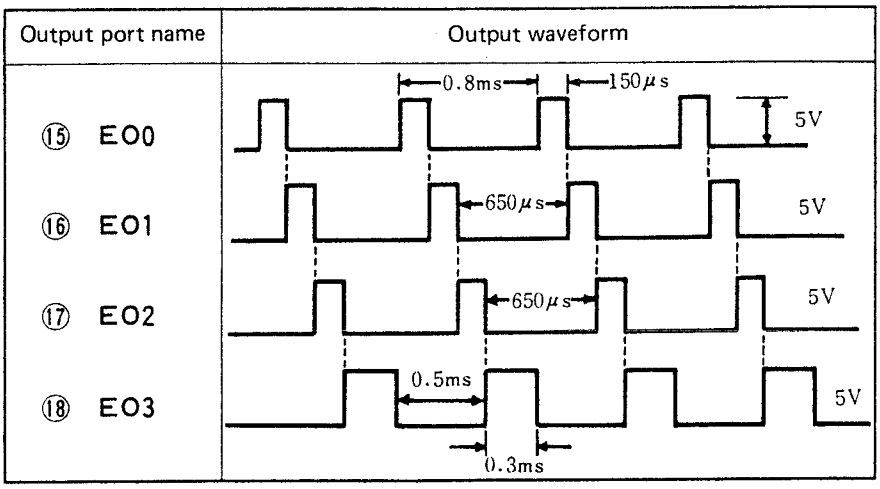
Microcomputer for remote-control decode is inserted between OP CON and key matrix so that only outputs with various switches of key matrix turned ON are put in P00 - P03 and P10 of OP CON.
Similarly, REMO CON signal is put in OP CON through micro-computer for remote-control decode.


15 EO0
16 EO1
17 EO2
18 EO3
11 BI3
12 BI2
13 BI1
14 BI0
7 AI3
9 AI1
10 AI0
8 AI2
5 bit output
CO8 3
DO0 23
DO1 24
DO2 25
DO3 26
OSC 28
RST 20
Microcomputer for remote control decorder
IC611
MN1421PCM
+5V
Q612
C633
7 PI0
2 P00
3 P01
4 P02
5 P03
12 SYNC
17 RST
48 P83
10 PI3
9 PI2
Operation control
IC612
MN1564PCL
OFF
AUTO PAUSE
TIMER PLAY
S651

Output waveforms:

with power ON and all switches OFF

Remote-control decode microcomputer


Output port name
Output waveform
⑮ EO0
⑯ EO1
⑰ EO2
⑱ EO3
0.8ms
150μs
5V
650μs
5V
650μs
5V
0.5ms
5V
0.3ms

2. Operation control circuit

Functions of Operation Controller MN1564PCL

<table>
<tr><th>Pin No.</th><th>Pin Name</th><th>Symbol</th><th>I/O</th><th>Function</th></tr>
<tr><td>2</td><td>P 00</td><td>DO 0</td><td>I</td><td>Data input terminal
From microcomputer for MN1421 remote-control decoder</td></tr>
<tr><td>3</td><td>P 01</td><td>DO 1</td><td>〃</td><td></td></tr>
<tr><td>4</td><td>P 02</td><td>DO 2</td><td>〃</td><td></td></tr>
<tr><td>5</td><td>P 03</td><td>DO 3</td><td>〃</td><td></td></tr>
<tr><td>7</td><td>P 10</td><td>DO 4</td><td>〃</td><td></td></tr>
<tr><td>9</td><td>P 12</td><td>TIMER</td><td>〃</td><td>Timer play select "L" .... Timer play</td></tr>
<tr><td>10</td><td>P 13</td><td>AUTO P</td><td>〃</td><td>Auto pause select "L"........ Auto pause</td></tr>
<tr><td>14</td><td>IRQ</td><td>BLKCK</td><td>〃</td><td>Sub cord decord input from MN6614</td></tr>
<tr><td>15</td><td>SBT</td><td>CLDCK</td><td>〃</td><td></td></tr>
<tr><td>16</td><td>SBD</td><td>SUBQ</td><td>〃</td><td></td></tr>
<tr><td>62</td><td>OSC1</td><td>TTCK</td><td>〃</td><td>Standard clock of system 4.32MHz</td></tr>
<tr><td>18</td><td>P 20</td><td>A 0</td><td>O</td><td>Address output of 4K RAM
(In/Output from MN2114)</td></tr>
<tr><td>19</td><td>P 21</td><td>A 1</td><td>〃</td><td></td></tr>
<tr><td>20</td><td>P 22</td><td>A 2</td><td>〃</td><td></td></tr>
<tr><td>21</td><td>P 23</td><td>A 3</td><td>〃</td><td></td></tr>
<tr><td>22</td><td>P 30</td><td>A 4</td><td>〃</td><td></td></tr>
<tr><td>23</td><td>P 31</td><td>A 5</td><td>〃</td><td></td></tr>
<tr><td>24</td><td>P 32</td><td>A 6</td><td>〃</td><td></td></tr>
<tr><td>25</td><td>P 33</td><td>A 7</td><td>〃</td><td></td></tr>
<tr><td>30</td><td>P 50</td><td>A 8</td><td>〃</td><td></td></tr>
<tr><td>31</td><td>P 51</td><td>A 9</td><td>〃</td><td></td></tr>
<tr><td>26</td><td>P 40</td><td>I/O 1</td><td>I/O</td><td>Data in/out of 4K RAM</td></tr>
<tr><td>27</td><td>P 41</td><td>I/O 2</td><td>〃</td><td></td></tr>
<tr><td>28</td><td>P 42</td><td>I/O 3</td><td>〃</td><td></td></tr>
<tr><td>29</td><td>P 43</td><td>I/O 4</td><td>〃</td><td></td></tr>
<tr><td>32</td><td>P 52</td><td>WE</td><td>O</td><td>WE signal of 4K RAM</td></tr>
<tr><td>41</td><td>P 70</td><td>DCLOSE</td><td>〃</td><td rowspan="2">Disc holder control
<table>
<tr><th></th><th>OPEN</th><th>CLOSE</th><th>STOP</th></tr>
<tr><td>P 70</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>P 71</td><td>0</td><td>1</td><td>1</td></tr>
</table></td></tr>
<tr><td>42</td><td>P 71</td><td>D OPEN</td><td>〃</td></tr>
<tr><td>49</td><td>P 90</td><td>REST</td><td>I</td><td>Reset position detector "L" .... ON</td></tr>
<tr><td>50</td><td>P 91</td><td>END</td><td>〃</td><td>Disc outermost detector terminal "L"... ON</td></tr>
<tr><td>51</td><td>P 92</td><td>CLOSE 2</td><td>〃</td><td>Disc holder "open close" detector "L" . . .ON</td></tr>
<tr><td>52</td><td>P 93</td><td>CLOSE 1</td><td>〃</td><td></td></tr>
<tr><td>53</td><td>P 94</td><td>OPEN</td><td>〃</td><td></td></tr>
<tr><td>8</td><td>P 11</td><td>RF</td><td>〃</td><td>RF signal detection "L" .... RF signal</td></tr>
<tr><td>63</td><td>IC 1</td><td>TCNT</td><td>〃</td><td>Track counter input</td></tr>
<tr><td>43</td><td>P 72</td><td>KICK</td><td>O</td><td>Kick pulse</td></tr>
<tr><td>44</td><td>P 73</td><td>KICK F/R</td><td>〃</td><td>Kick pulse "L" reverse</td></tr>
<tr><td>45</td><td>P 80</td><td>LDON</td><td>〃</td><td>TT ON signal</td></tr>
<tr><td>40</td><td>P 63</td><td>TRON</td><td>〃</td><td>TR ON signal</td></tr>
</table>

Table 3 Function of operation controller MN1564PCL

<table>
<tr><th>Pin No.</th><th>Pin Name</th><th>Symbol</th><th>I/O</th><th>Function</th></tr>
<tr><td>37</td><td>P 60</td><td>REV</td><td>O</td><td rowspan="2">Traverse servo control<table><tr><th></th><th>FWD</th><th>REV</th><th>PLAY</th><th>STOP</th></tr><tr><td>P 60</td><td>1</td><td>0</td><td>1</td><td>0</td></tr><tr><td>P 61</td><td>0</td><td>1</td><td>1</td><td>0</td></tr></table></td></tr>
<tr><td>38</td><td>P 61</td><td>FWD</td><td>〃</td></tr>
<tr><td>36</td><td>P 53</td><td>EMPH</td><td>O</td><td>Emphasis, "H" ....ON</td></tr>
<tr><td>46</td><td>P 81</td><td>MUTE</td><td>〃</td><td>Muting "L" ....Muting</td></tr>
<tr><td>47</td><td>P 82</td><td>ATSB</td><td>〃</td><td>Attenation ....ON/OFF output</td></tr>
<tr><td>48</td><td>P 83</td><td>SYNCH</td><td>〃</td><td>Synchro REC control "L" .... Synchro REC.</td></tr>
<tr><td>54</td><td>PA 1</td><td>DECHO</td><td>I</td><td rowspan="7">In/Out pin of micon (MN1430) for FL driver</td></tr>
<tr><td>55</td><td>PA 2</td><td>DCLOCK</td><td>O</td></tr>
<tr><td>56</td><td>PA 3</td><td>DSEND</td><td>〃</td></tr>
<tr><td>57</td><td>PB 0</td><td>DDATA 0</td><td>〃</td></tr>
<tr><td>58</td><td>PB 1</td><td>〃 1</td><td>〃</td></tr>
<tr><td>59</td><td>PB 2</td><td>〃 2</td><td>〃</td></tr>
<tr><td>60</td><td>PB 3</td><td>〃 3</td><td>〃</td></tr>
</table>

2-1. Function of the operation control circuit

The important feature of compact disc is that it is capable of random access not only to tune number but also to minutes and seconds by use of control signal recorded on the disc. SL-P7 is able to store minutes and seconds up to 20 tunes in the memory.
In SL-8, with 4-bit RAM connected, all TOC of minutes and seconds up to 32 tunes can be stored in the memory
Accordingly, the range of random access is greatly expanded.
Also, CD player system is equipped with optical servo circuit in order to take out the signal by correctly applying the laser spot to the pit since the system uses laser light to read signals, which therefore requires various servo timings.
The operation control circuit serves as a control center for the entire system.

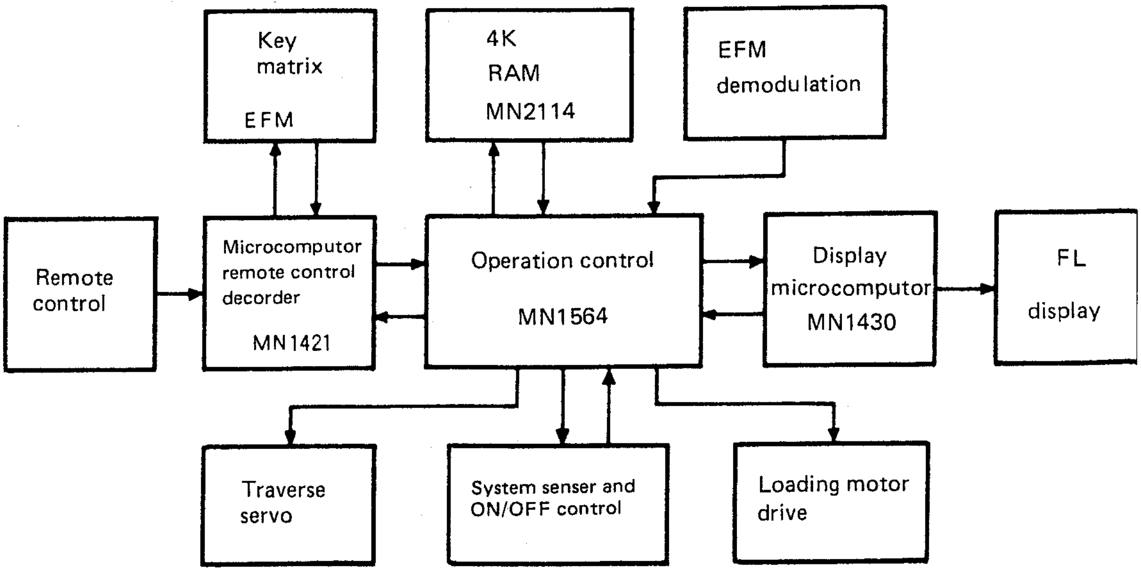

Key matrix EFM
4K RAM MN2114
EFM demodulation
Remote control
Microcomputor remote control decorder MN1421
Operation control MN1564
Display microcomputor MN1430
FL display
Traverse servo
System senser and ON/OFF control
Loading motor drive

Fig. 8 Block diagram of opeation contrl circuit

The operation control circuit involves operation controller (MN1564PCL) as the main component. LSI MN6614 (IC701) demodulates the control information from EFM data and transfers it to the operation controller.
The operation controller controls the traverse motor and display microcomputer with those signals for the purposes of play time display, track No. display and bar graph display.
In addition, there are sensors and timing ON/OFF signals such as follows:

Sensors

1) Innermost periphery detection (REST):
   To check if PU is at the innermost periphery of disc.

2) Outermost periphery detection (END):
   To check if PU is unable to go beyond the outermost periphery of disc (60 mm in radius).

3) Disc holder open/close detection (OPEN, CLOSE 1, 2):
   To check if disc holder is open or closed.

Timing ON/OFF signals

1) Laser ON/Turntable and focus servo ON command: (LD/TT/Fo ON)
2) Tracking servo ON command: (TR ON)
3) Muting relay ON/OFF command: (MUTE)
4) Emphasis ON/OFF command: (EMPHA)
5) Traverse REV/FWD command: (REV/FWD)
6) Kick timing command: (KICK)
7) Kick direction command: (KICK F/R)
8) Attenuation ON/OFF command: (ATSB)

There are also timer play selection, auto pause selection, synchro record control signal output, key matrix remote-control decoder, and various display functions.

2-2. Circuit around operation controller

1. Loading motor drive circuit

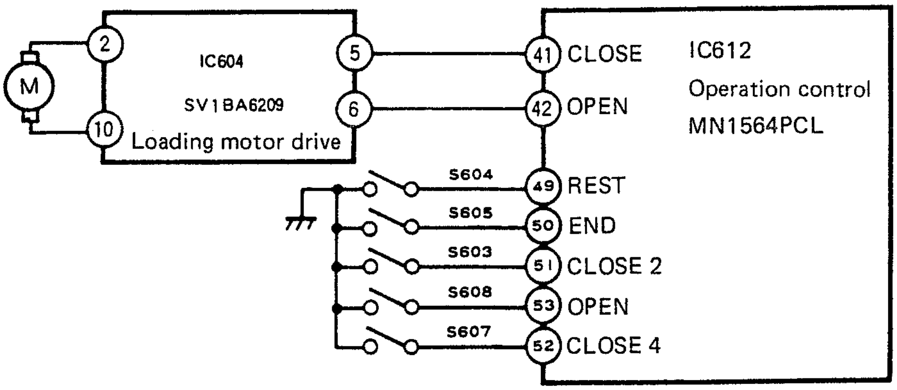

M
2
10
IC604
SV1BA6209
Loading motor drive
5
6
41 CLOSE
42 OPEN
49 REST
50 END
51 CLOSE 2
53 OPEN
52 CLOSE 4
S604
S605
S603
S608
S607
IC612
Operation control
MN1564PCL

Fig. 9 Loading motor drive circuit

The loading motor circuit is the same as that of SL-P7. REST, END, CLOSE 2, CLOSE 1, and OPEN sensor switches are located in the loading mechanism, but in SL-P7, they are built into the key matrix circuit.
In SL-P8, sensor detection signal is directly put into operation controller. The operation is the same as in SL-P7.

2. RAM circuit
RAM is provided for TOC memory up to 99 tunes and for random access of 32 sets. SL-P8 displays only up to 20 tunes, and gives "over" display " ▶ " for more than that, but it is capable of TOC memory of track No., minutes and seconds up to 99 tunes.
Also, random access up to 32 sets is possible by use of numeric key, memory key, index key, and time key, with the assignment of start and stop time of a certain tune being 1 set.

3. Data transfer of operation controller from EFM demodulation
Data transfer from EFM demodulator (MN6614) to operation controller (MN1564PCL) are control Q data demodulated from EFM data.
The control Q data (96 pcs) are put into operation controller 12 times by 8 pcs each (8 x 12 = $\underline{96 \rightarrow 1}$ block) according to the timing of CLDCK and $\overline{\text{BLKCK}}$.
This is repeated to put control Q data signal into operation controller.

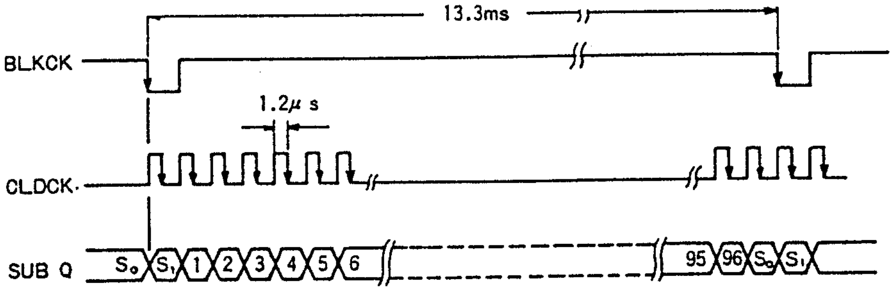


Fig. 10 Data transfer timing from MN6614 to MN1564PCL

Control Q data transferred from MN6614 are stored in the memory of operation controller. The stored data are taken out of the memory as needed as put out from each output terminal.

Use of Q channel

Details of tunes recorded on the lead-in track, program track and lead-out track of disc are recorded and used for display and control.

Lead-in track

Music No.	Point (Tune No.)	Lapse of tune time (Min. Sec. Frame)	Zero	Total lapse of time (Min. Sec. Frame)

Program track and lead-out track

Control emphasis YES/NO	Descri No.	Music No.	Index of music No.	Lapse of tune time	Zero	Total lapse of time

Data taken out of Q data are as follows:

1) Display (music No. and its index, lapse of time, bar graph) outputs are delivered as 4-bit parallel data. (Output terminals 57 - 60)

2) Emphasis YES/NO
It reads whether emphasis is given or not and turns ON/OFF the de-emphasis circuit. (Output terminal 36)

Other functions

°Traverse direction command (Output terminals 33, 38)
Direction command pulse is put out in skip mode.

	FWD	REV	PLAY	STOP
㊲	H	L	H	L
㊳	L	H	H	L

°Kick timing and kick direction command (Output terminals 43, 44)

Kick timing and direction command pulses are put out after skip mode and Cue/Rev mode.

°Attenuation ON/OFF (Output terminal 47)

It is given to level down the output in Cue/Rev mode by 12 dB, and is effective at "H" level.

3. Pitch control circuit

3-1. Features of SL-P8 pitch control

In an ordinary system, pitch control has been performed by changing only the motor speed.

In SL-P8, timing clock for music signal demodulation is changed as well so that it can be varied continuously in a range of ±6%.

Usually, it is used with pitch control OFF, and then correct pitch is assured.

3-2. Principle of pitch control

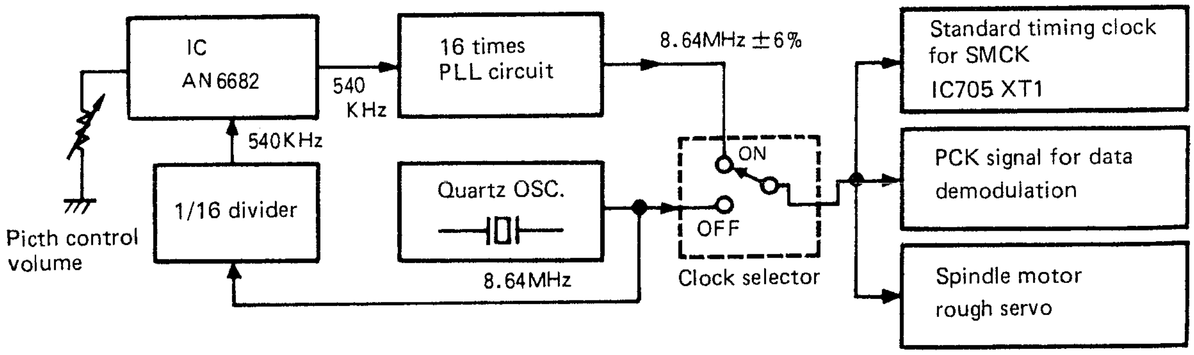

IC
AN6682
540
KHz
16 times
PLL circuit
8.64MHz ±6%
Standard timing clock
for SMCK
IC705 XT1
540KHz
ON
PCK signal for data
demodulation
1/16 divider
Quartz OSC.
OFF
Picth control
volume
8.64MHz
Clock selector
Spindle motor
rough servo

Fig. 11 Block diagram of pitch control (SL-P8)

The pitch control of SL-P8 uses the master clock of the whole system as a fixed output, and takes out ±6% variable output by putting the output into the frequency variable circuit.

The clock selector is usually OFF and maintains a constant speed with the quartz oscillation output of master clock. With pitch control ON, ±6% variable output is applied to SMCK reference timing clock, data demodulation PCK signal and spindle motor rough servo circuits, thereby performing smooth pitch control.

3-3. Frequency variable circuit

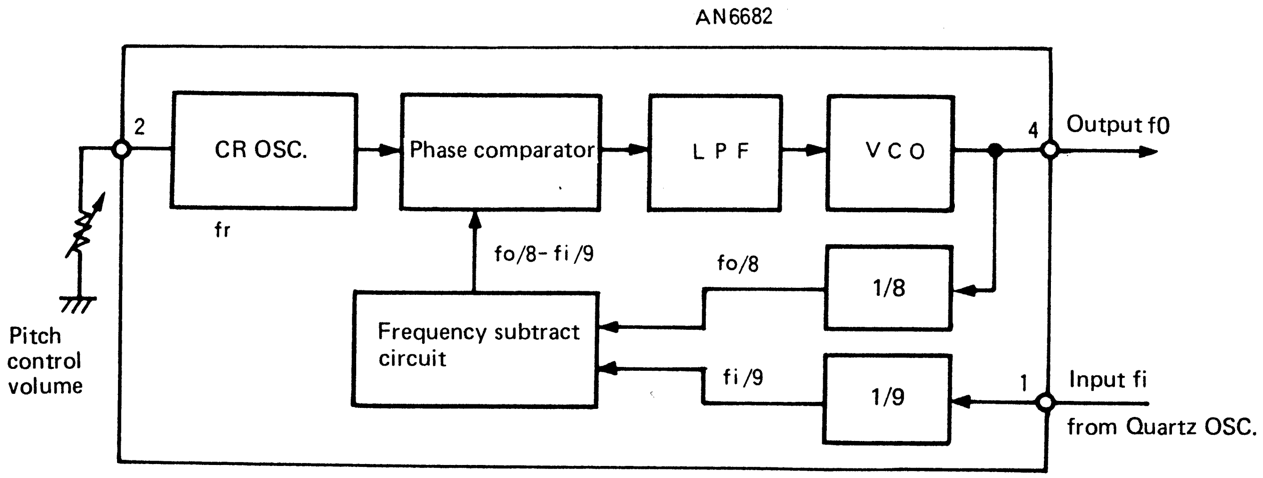

AN6682
2
CR OSC.
Phase comparator
L P F
V C O
4
Output f0
fr
fo/8- fi /9
fo/8
1/8
Frequency subtract circuit
fi /9
1/9
1
Input fi
from Quartz OSC.
Pitch control volume

Fig. 12 Frequency variable circuit

Pitch control IC AN6682 is able to change the frequency of CR oscillator by pitch control volume, and the output frequency can be stabilized by setting up an PLL configuration in combination with the frequency from external quartz oscillator.

With input frequency fi, output frequency fo, and CR oscillator frequency fr, the following equations can be obtained.

$$fr = \frac{fo}{8} - \frac{fi}{9} \qquad fo = 8\ (fr + \frac{fi}{9})$$

Here, suppose the quartz oscillator frequency is 540 kHz, then fi/9 = 60 Hz. If fo = 540 kHz, fr is lower (actually, 3 - 20 kHz) so that stable variable output can be obtained.

3-4. Frequency multiplication circuit

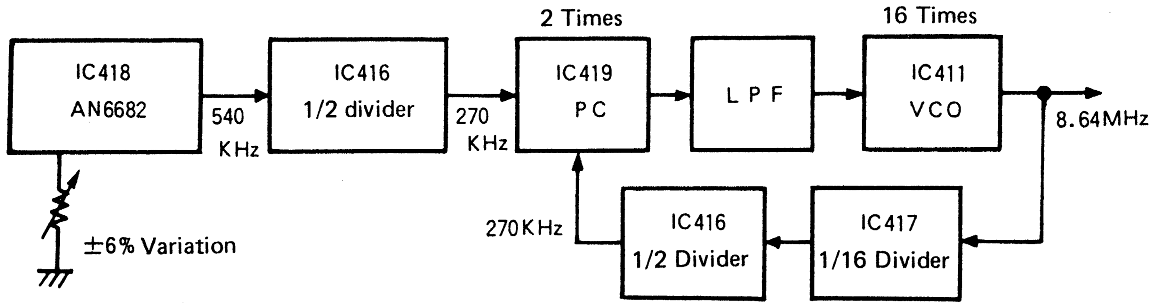

2 Times
16 Times
IC418
AN6682
540 KHz
IC416
1/2 divider
270 KHz
IC419
P C
L P F
IC411
V C O
8.64MHz
±6% Variation
270KHz
IC416
1/2 Divider
IC417
1/16 Divider

Fig. 13 Frequency multiplication circuit

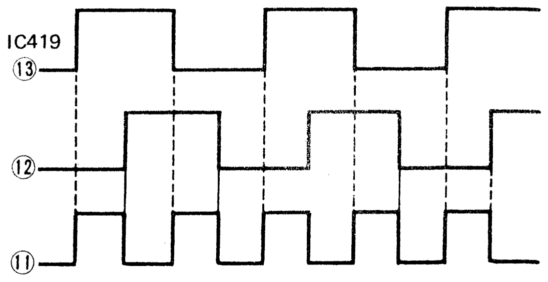
VoL. 1.

This circuit multiplies the output frequency 540 kHz of AN6682 up to 8.64 MHz.

IC416 performs 1/2 frequency division so that the output of AN6682 is 50% duty.

Also, IC411 oscillates 8.64 MHz, and it is subjected to 1/32 frequency division and phase comparison at IC419 in order to operate VCO of IC411 ----- PLL circuit.

Since the input phase of IC419 terminals 12 and 13 is deflected 90°, the output at terminal 11 is 1/2 of the input.



Input/output waveform of IC419

3-5. Clock selector circuit

This circuit selects quartz oscillation frequency in pitch control OFF mode, and variable frequency from AN6682 in pitch control ON mode.

Pitch control OFF

Pitch selector switch S652 is OFF, IC413 (11) at "L", (10) at "H", IC411 (5) at "H", and IC411 output stops.
On the other hand, IC412 (9) is at "H", but the output of quartz oscillator is applied to IC412 (10) and the output is delivered to IC412 (8), and goes from (5) to (6).

Pitch control ON

Pitch selector switch S652 is ON, IC413 (11) at "H", (10) at "L", then IC411 operates and the output is delivered from IC411 (6) to IC412 (2), (3) and (6).

On the other hand, IC412 (9) is at "L", and quartz oscillator output is not applied to IC412 (8).

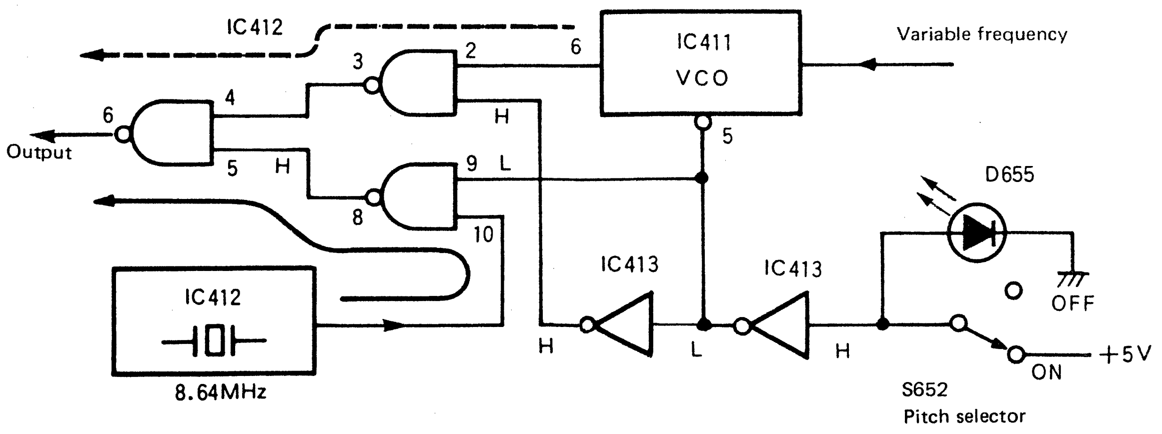

IC412
2
6
IC411
VCO
Variable frequency
3
4
6
Output
5
H
H
9
L
5
D655
8
10
IC413
IC413
IC412
8.64MHz
H
L
H
OFF
ON
+5V
S652
Pitch selector

Fig. 14 Clock selector circuit

Block Diagram

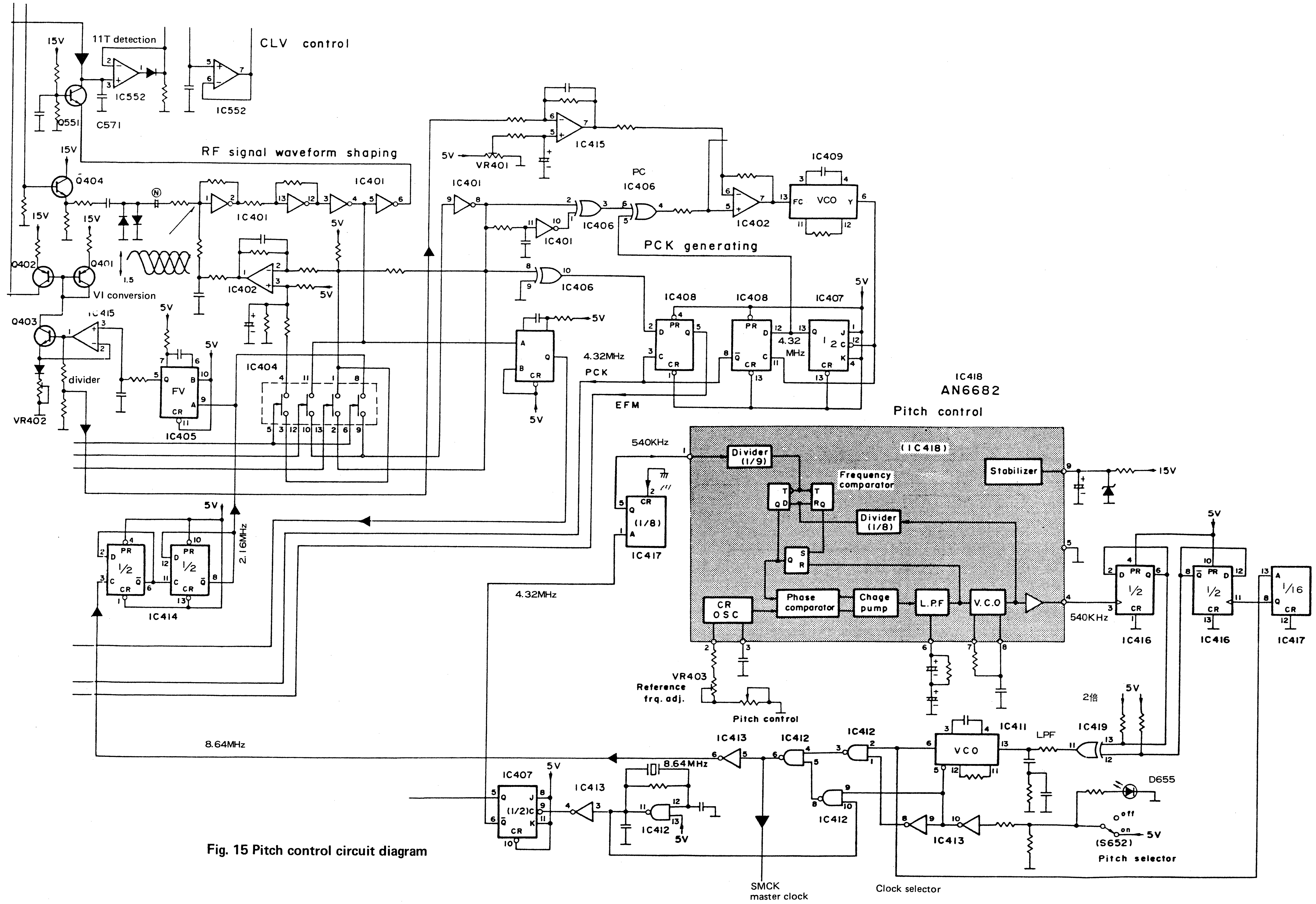

15V
11T detection
IC552
C571
Q551
CLV control
IC552
RF signal waveform shaping
15V
Q404
15V
15V
IC401
IC401
Q402
Q401
1.5
VI conversion
IC402
5V
5V
IC415
Q403
VR402
divider
5V
5V
FV
CR
IC405
IC404
IC415
5V
VR401
IC401
PC
IC406
IC406
IC401
PCK generating
IC402
IC409
FC
VCO
IC406
IC408
IC408
IC407
5V
PR
CR
4.32 MHz
4.32MHz
PCK
EFM
5V
IC418
AN6682
Pitch control
540KHz
(IC418)
Divider (1/9)
Frequency comparator
Stabilizer
15V
CR
(1/8)
IC417
Divider (1/8)
5V
2.16MHz
1/2
1/2
IC414
4.32MHz
CR OSC
Phase comparator
Chage pump
L.P.F
V.C.O
540KHz
1/2
IC416
1/2
IC416
1/16
IC417
VR403
Reference frq. adj.
Pitch control
2倍
5V
8.64MHz
IC413
IC412
IC412
IC411
VCO
LPF
IC419
IC407
5V
(1/2)C
IC413
8.64MHz
IC412
5V
IC412
IC413
D655
off
on
(S652)
5V
Pitch selector
SMCK master clock
Clock selector

Fig. 15 Pitch control circuit diagram

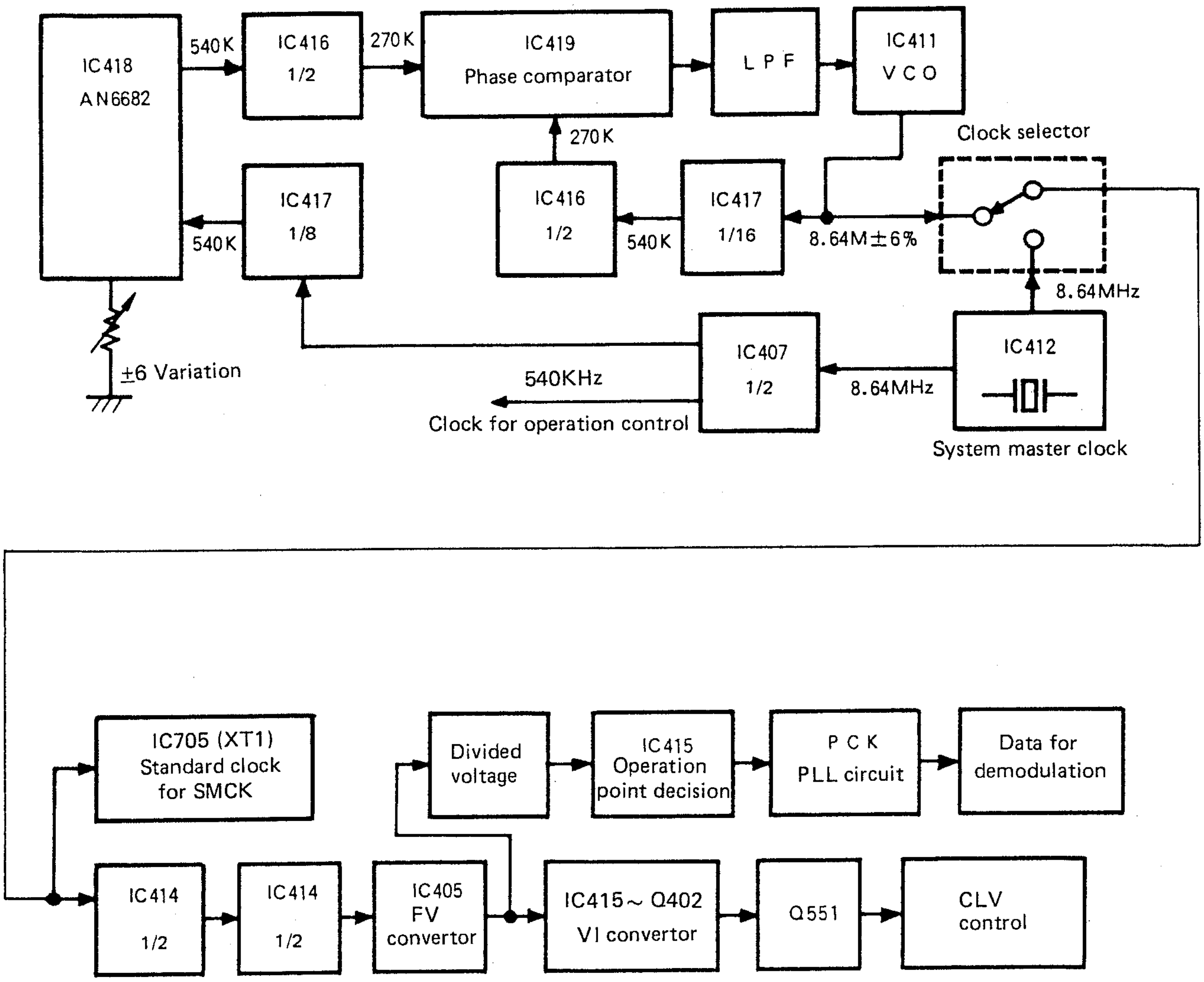

IC418
AN6682
540K
IC416
1/2
270K
IC419
Phase comparator
LPF
IC411
VCO
270K
Clock selector
IC417
1/8
540K
IC416
1/2
540K
IC417
1/16
8.64M±6%
8.64MHz
±6 Variation
IC407
1/2
8.64MHz
IC412
540KHz
Clock for operation control
System master clock
IC705 (XT1)
Standard clock
for SMCK
Divided
voltage
IC415
Operation
point decision
PCK
PLL circuit
Data for
demodulation
IC414
1/2
IC414
1/2
IC405
FV
convertor
IC415～Q402
VI convertor
Q551
CLV
control

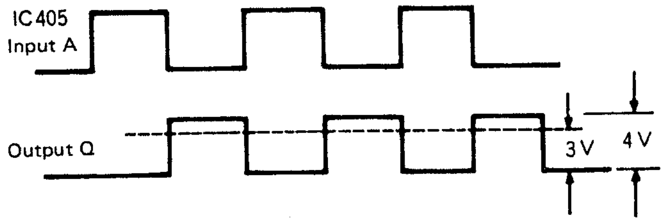
Fig. 16 Block diagram of pitch control

3-6. CLV control circuit

1. 8.64 MHz from IC413 is subjected to 1/4 frequency division at IC414 in order to make F-V conversion easier.

2. The frequency is subjected to F-V conversion at IC405, and becomes DC voltage through R449 and C443 filter, and is applied to IC415 (3) of V-I conversion circuit. The output is applied to the base of Q403. Q401 and Q402 set up a current mirror, and the output current is applied to the Q551 collector from Q402 collector.

3. Q551 collector current is much when pitch control is +6%, and voltage charged into C571 is greater, causing the triangular output wave of IC552 to become larger. With pitch control set at -6%, the triangular output wave of IC552 becomes smaller. In this way, CLV control is performed by changing the output of 11T detection circuit.


IC405
Input A
Output Q
3V
4V

In/Out-put waveform of IC405

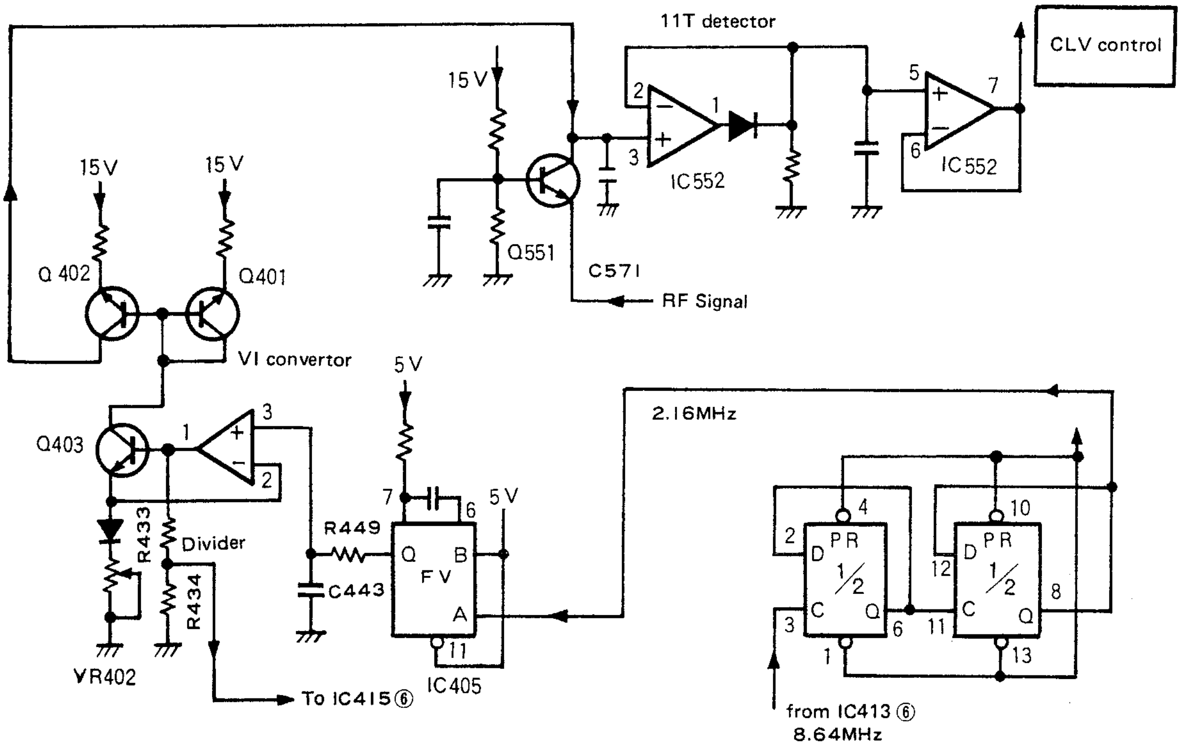

11T detector
CLV control
15V
2
1
3
IC552
5
7
6
IC552
Q551
C571
RF Signal
15V
15V
Q 402
Q401
VI convertor
5V
2.16MHz
Q403
1
3
2
R433
Divider
R434
VR402
To IC415⑥
7
6
5V
R449
C443
Q
B
FV
A
11
IC405
2
4
PR
D
1/2
C
Q
3
6
1
11
12
10
PR
D
1/2
C
Q
8
13
from IC413 ⑥
8.64MHz

Fig. 17 CLV control citcuit

3-7. PCK clock signal

The PCK signal generation circuit consists of IC409, IC407, IC406 and IC402 which set up PLL circuit.

1. Output voltage is V-I conversion circuit IC415 is divided by R433 and R434, and the output is applied to IC415 (6), and to IC409 (13) through IC402.

2. Voltage applied to IC409 (13) serves to change the operation point of VCO of IC409.
   When pitch control is OFF, the operation point of IC409 is at 0, then the frequency is stabilized in the capture range.
   With pitch control at +6%, the voltage from IC415 and IC402 causes the operation point of IC409 to be shifted toward higher frequency, making it stabilized in the capture range.

   With pitch control at -6%, the operation point is shifted toward lower frequency but in any case the alteration occurs in the lock range of PLL circuit, resulting in stabilizing the frequency.

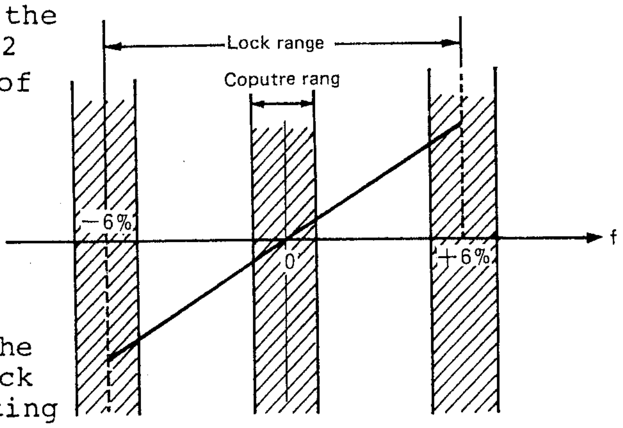

Lock range
Coputre rang
−6%
0
+6%
f

Fig. 18 Operation point of IC409

3. The output of PLL circuit enters IC408 terminal (11) from IC409 terminal (6) and is put out as PCK signal from terminal (8).

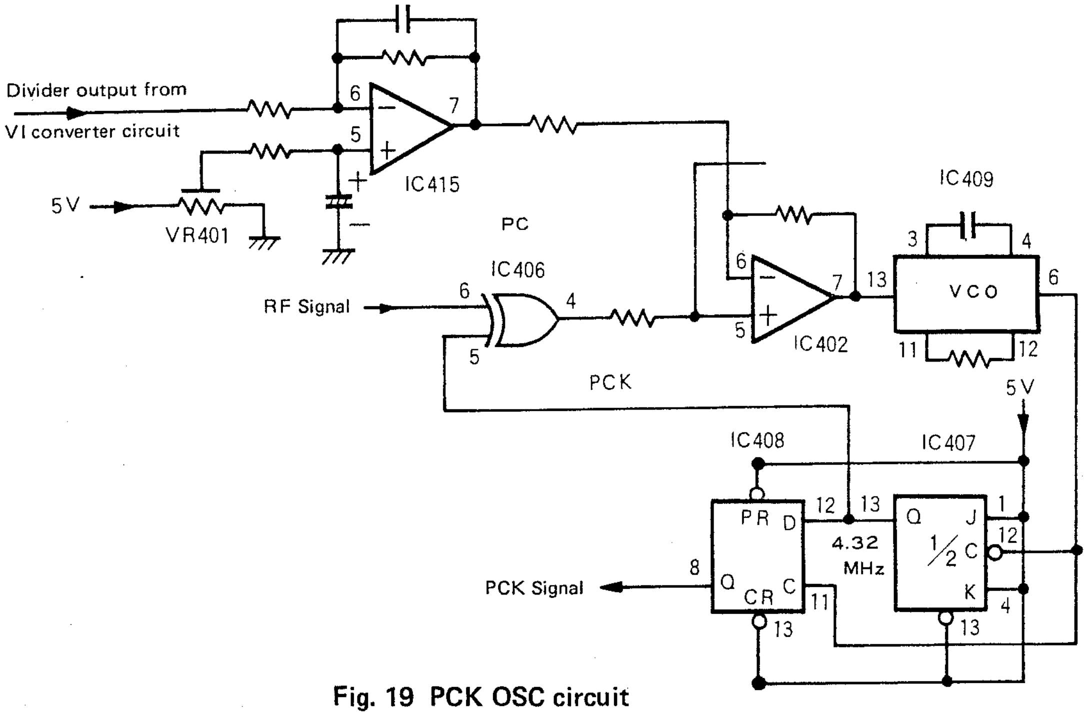

Divider output from
VI converter circuit
6
5
7
IC415
5V
VR401
PC
IC406
RF Signal
6
5
4
6
5
7
13
IC402
IC409
3
4
VCO
6
11
12
5V
PCK
IC408
IC407
PR
D
12
13
4.32
MHz
Q
J
1/2
C
K
1
12
4
8
PCK Signal
Q
CR
C
11
13
13

Fig. 19 PCK OSC circuit

4. Display circuit

4-1. Function of display

Display microcomputer MN1430G operates according to the data of operation controller for display purposes.

1. Music No. scale:

   Displays up to 20 tunes. Keeps lighting with power ON.

2. Music No. display bar:

   20 tunes max.; if it exceeds 20 tunes, "over" mark "▶" lights up on the right-hand side of bar.
   Music No. display bar blinks during play mode. Play END bar goes out. Programed music No. display bar is shown.

3. Track display:

   Displays the number of tunes.

4. Time display:

   Displays total play time (reading TOC), play and remaining time.
   With index key depressed, index No. is displayed.

Differences in display function between SL-P7 and SL-P8

1. Display tube of SL-P7 is provided only for the track and time, and not for music number scale and music No. display bar.

2. In terms of circuit, B port of display microcomputer MN1430G is for model selection, and the inside program can be selected by setting the level to H (15 V) in SL-P7 and L (0 V) in SL-P8.
   In SL-P7, bar code is not used, therefore nothing is connected to E port, while it is used for bar code in the case of SL-P8.

4-2. Configuration of display circuit

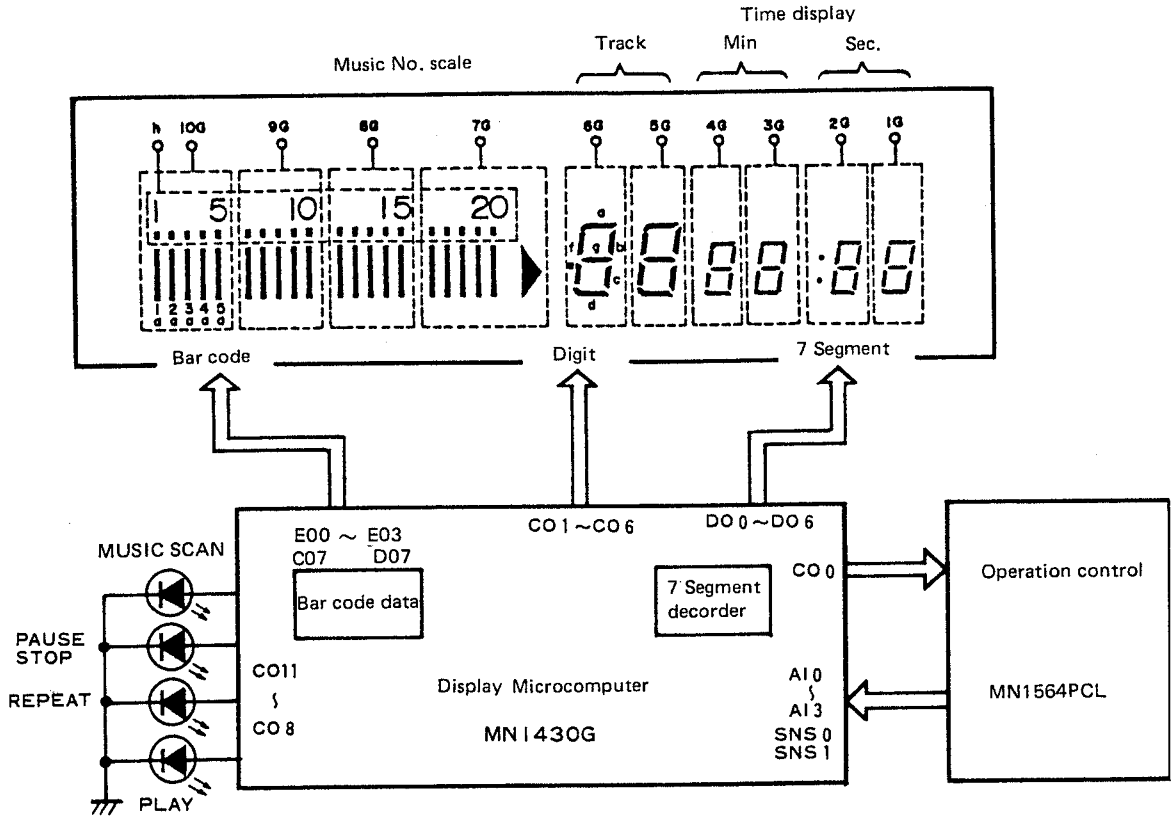

Time display
Track
Min
Sec.
Music No. scale
h
10G
9G
8G
7G
6G
5G
4G
3G
2G
1G
1
5
10
15
20
1 2 3 4 5
a
b
c
d
f
g
Bar code
Digit
7 Segment
MUSIC SCAN
PAUSE
STOP
REPEAT
PLAY
E00 ~ E03
C07 D07
Bar code data
CO1~CO6
DO0~DO6
7 Segment decorder
CO0
CO11
CO8
Display Microcomputer
MN1430G
AI0
AI3
SNS0
SNS1
Operation control
MN1564PCL

Fig. 20 Display circuit

FL lighting operation

Display digit is decided from C output port of display microcomputer, and 7-segment display data is delivered from D port for the purpose of track and time display. The music No. bar code is lighted by E00 - E03, C07 and D07. The output of D07 becomes the "over" mark command (over 21 tunes) during the 4th digit display, and the colon lighting command of segment display during the 5th digit display.
Also, 4 LED's are lighted by the output of C08 - C011.

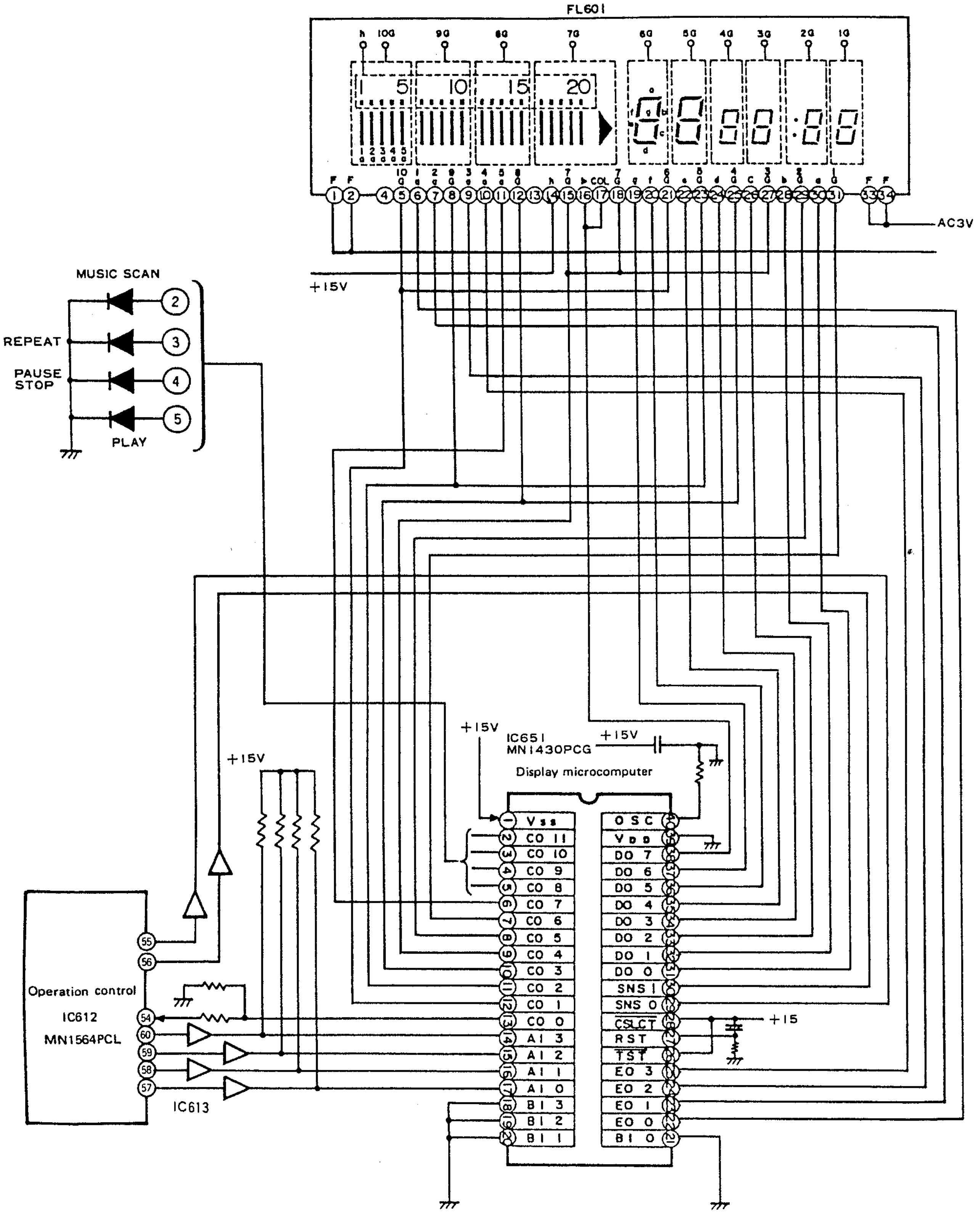

FL601
h
10G
9G
8G
7G
6G
5G
4G
3G
2G
1G
1
5
10
15
20
F
F
COL
AC3V
+15V
MUSIC SCAN
REPEAT
PAUSE
STOP
PLAY
+15V
IC651
MN1430PCG
+15V
Display microcomputer
Vss
CO 11
CO 10
CO 9
CO 8
CO 7
CO 6
CO 5
CO 4
CO 3
CO 2
CO 1
CO 0
AI 3
AI 2
AI 1
AI 0
BI 3
BI 2
BI 1
OSC
VDD
DO 7
DO 6
DO 5
DO 4
DO 3
DO 2
DO 1
DO 0
SNS 1
SNS 0
CSLCT
RST
TST
EO 3
EO 2
EO 1
EO 0
BI 0
+15
+15V
Operation control
IC612
MN1564PCL
IC613

Fig. 21 Circuit diagram of display

4-3. Operation of display microcomputer

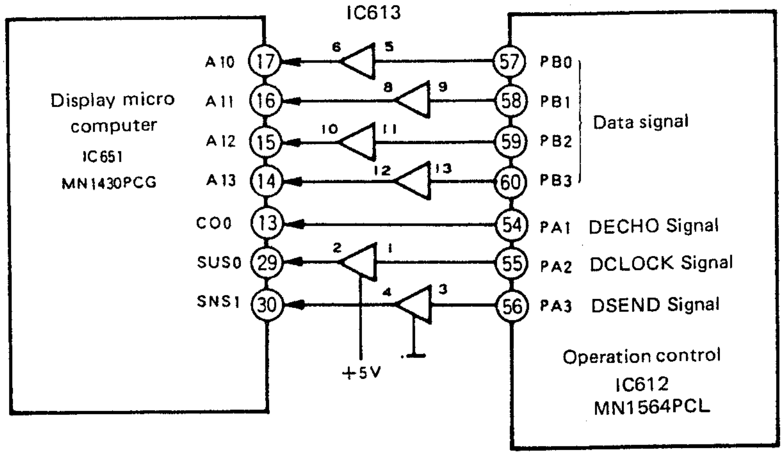

IC613
Display micro computer
IC651
MN1430PCG
A10 17
A11 16
A12 15
A13 14
CO0 13
SUS0 29
SNS1 30
6
5
8
9
10
11
12
13
2
1
4
3
+5V
57 PB0
58 PB1
59 PB2
60 PB3
Data signal
54 PA1 DECHO Signal
55 PA2 DCLOCK Signal
56 PA3 DSEND Signal
Operation control
IC612
MN1564PCL

Fig. 22 Connection chart of microcomputer

1. When DSEND signal is applied to IC651 (30) SNS1 from operation control circuit, it is ready to receive the display data.

2. DCLOCK signal is delivered from operation control circuit, and 4-bit display data signal is delivered to IC651 A port.
   A variety of display are given by the data.

3. IC651, receiving data signal, deliveres DECHO signal from CO0, and waits for the next data receiving timing.

Display Microcomputer operation

Terminal No.	Name of block	Symbol	Operation
14~17	A Input port	AI0~AI3	Data in from opecon.
18~21	B Input port	BI0~BI3	For model change SL-7 ...."H" (+15V) SL-P8 ...."L" (GND)
29	Sens input	SNS0	DCLOCK from Opecon.
30		SNS1	DSEND In from opecon.
13	C output port	CO0	DECHO Out to opecon.
7~12		CO1~CO6	Digit on of FL out
6		CO7	FL bar code on (5th bar) Output
2~5		CO8~CO11	LED ON output
31~37	D output port	DO0~DO6	7 segment display out
38		DO7	Colon over lights up out
22~25	E output port	EO0~EO3	Bar code ON out (1st – 4th)
1	Power input	VSS	+15V
39	〃	VDD	0V
40	OSC. input	OSC	200KHz
27	RESET	RST	Reset at "L"
26	Test input	TST	Connect to +15V
28		CSLCT	〃

Table 4 Display microcomputer operation

4-4. Display ON-timing

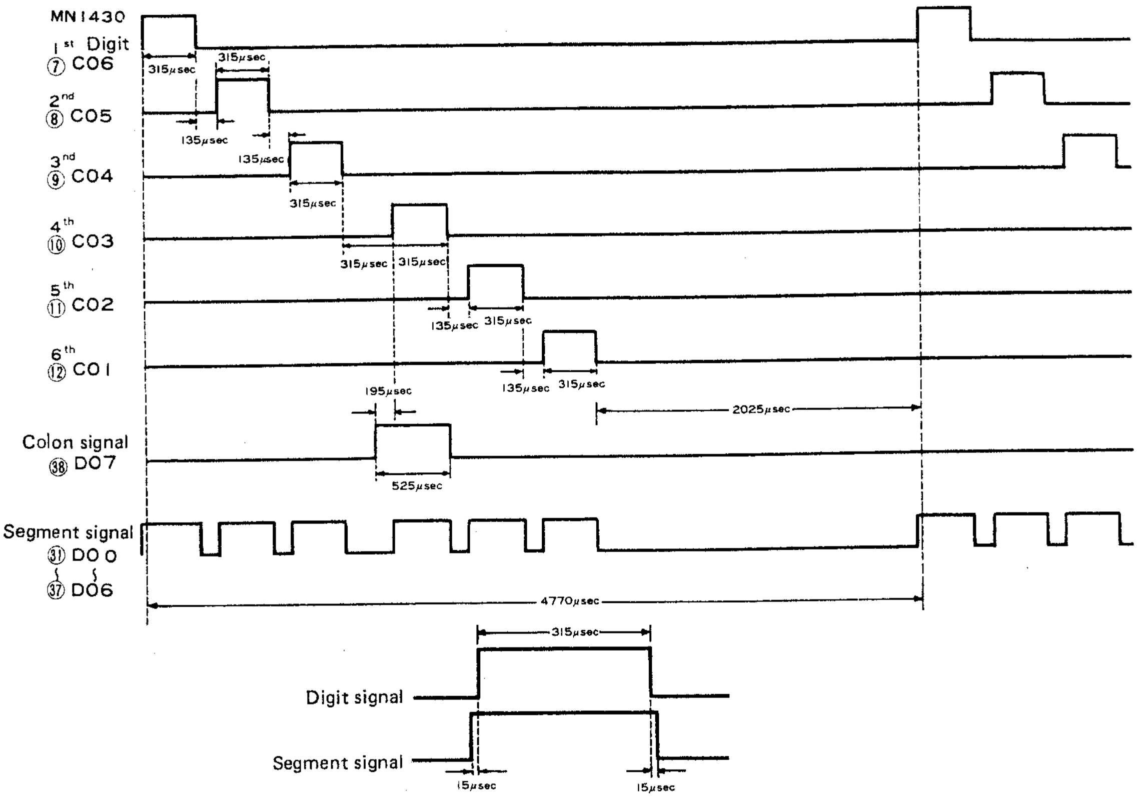

MN1430
1st Digit
⑦ CO6
2nd
⑧ CO5
3rd
⑨ CO4
4th
⑩ CO3
5th
⑪ CO2
6th
⑫ CO1
Colon signal
㊳ DO7
Segment signal
㉛ DO0
㊲ DO6
315μsec
315μsec
135μsec
135μsec
315μsec
315μsec
315μsec
135μsec
315μsec
195μsec
135μsec
315μsec
2025μsec
525μsec
4770μsec
315μsec
Digit signal
Segment signal
15μsec
15μsec

Fig. 23 Display ON-Timing

4-5. Display command to display microcomputer

Various display command from operation control are put in A port of display microcomputer as shown in the following.

MN1430PCG Input Port	Input data	FL display	
A port ⑰ AI 0 ⑯ AI 1 ⑮ AI 2 ⑭ AI 3	0	For LED ON	SCAN REPEAT PAUSE PLAY 0101······PLAY and REPEAT ON
	1	Without colon segment ON	1B4BB15 --- 4 15
	2	With colon Segment ON	210B314 --- 10 3:14 B means blank
	3	Bar code all off	Rest
	A	Bar code all ON	A 0812··· 8th – 12th bars lighted
	B	Bar code flash ON	B 04······ 4th bar flashes
	C	Bar code ON	C 03······ Light up the 3rd bar
	D	Bar code off	D 03······ Light off the 3rd bar.

ORDER NO. DAD84050086S0

Service Manual

Supplement-2

COMPACT disc DIGITAL

Compact Disc Player
SL-P8/(K)

Please use this manual together with the service manual for Model No. SL-P8.

Notes:
- ★ The replacement parts for optical pickup have been supplied as traverse unit ass'y (optical pick-up deck unit), but they are individually supplied as optical pick-up since May 21, 1984.
- ★ This supplement includes the parts list and exploded view of loading drive mechanical and optical pick-up deck.
- ★ This supplement should be filed with the service manual for Model No. SL-P8.

■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description
LOADING MECHANICAL PARTS		
41	SRUM007N05E	Tray Ass'y, Disc (1)
42	SRUM008N04R	Disc Case Ass'y (1)
42-1	SRKK008N03	Ornament Plate, Disc Case (1)
43	SRUM007N07	Cam, Disc Case (1)
44	SRQH007N02	Spring (1)
45	SFYB-5-32-P	Nylon Ball (11)
46	SRUP007N07	Holder (2)
47	SRUP007N05A	Holder, Disc Clamper (1)
48	SRDJ007N12E	Connector Ass'y (1)
49	SRUM007N18	Cover, Switch (1)
50	SRQS007N02	Spring (1)
51	SRUG007N04	Gear, Return (1)
52	SRQH007N01	Spring, Return (1)
53	SRUM007N15	Guide Plate (2)
54	SRUM007N09	Rack Gear, Loading (1)
55	SRUP007N10E	Loading Guide Ass'y (1)
56	SRUM007N06	Lock Arm (1)
57	SRQS007N03	Spring, Lock Arm (1)
58	SRUP007N03R	Loading Base Ass'y (1)
59	SRDJ007N13E	Connector Ass'y (1)
60	SRUM007N17	Cover, Switch (1)
61	SRGB007N02	Belt, Loading Motor (1)
62	SRUG007N01	Pulley, Loading Motor (1)
63	SRQH007N03	Spring, Disc Clamper (1)
64	SRUG007N03	Gear, Loading (1)
65	SRUG007N02	Gear, Transmission (1)
66	SRMH007N01A	Motor, Loading (1)
67	SRDJ007N16E	Connector Ass'y (1)
68	SRUP007N15	Spacer (1)
69	SRUM007N24	Spacer, Disc Clamper (1)
70	SRGC007N07	Cushion Rubber, Disc Clamper (1)

Ref. No.	Part No.	Part Name & Description
OPTICAL PICK-UP DECK UNIT PARTS		
71 ⚠	SRLP007N01A	Optical Pick-up (1)
72	SRUM007N22	Bracket, Optical Pick-up (1)
73	SRQS007N01	Sprping, Bracket (1)
74	SRXJ007N01	Shaft, Optical Pick-up Guide (2)
75	SRUK007N02E	Optical Deck Unit Base Ass'y (1)
76	SRUP007N09	Holder (A), Shaft (2)
77	SRUP007N08	Holder (B), Shaft (1)
78	SRGC007N02	Cushion Rubber (4)
79	SRQA007N02	Spring(A), Cushion Rubber (2)
80	SRUP007N12	Holder, Spring (4)
81	SRQA007N01	Spring (B), Cushion Rubber (2)
82	SRMH007N02A	Motor, Optical Pick-up Drive (1)
83	SRQA007N03	Spring (2)
84	SRTE007N03	Holder, Turntable (1)
85	SRQA010N04	Spring (1)
86	SRTE007N11E	Turntable (1)
87	SRTM007N01A	Rotary Magnet Ass'y (1)
88	SRDJ007N20E	Connector Ass'y (1)
89	SRUM007N19	Holder, Motor (1)
90	SRDJ007N10E	Connector Ass'y (1)
91	SRXG007N01E	Wrom Gear Ass'y (1)
92	SRGC007N01	Cushion Rubber (1)
93	SRGB007N03	Belt (1)
94	SRLH007N08	Clamper, Lead Wires (1)
95	SRLC007N03	Cover, P.C. Baord (1)

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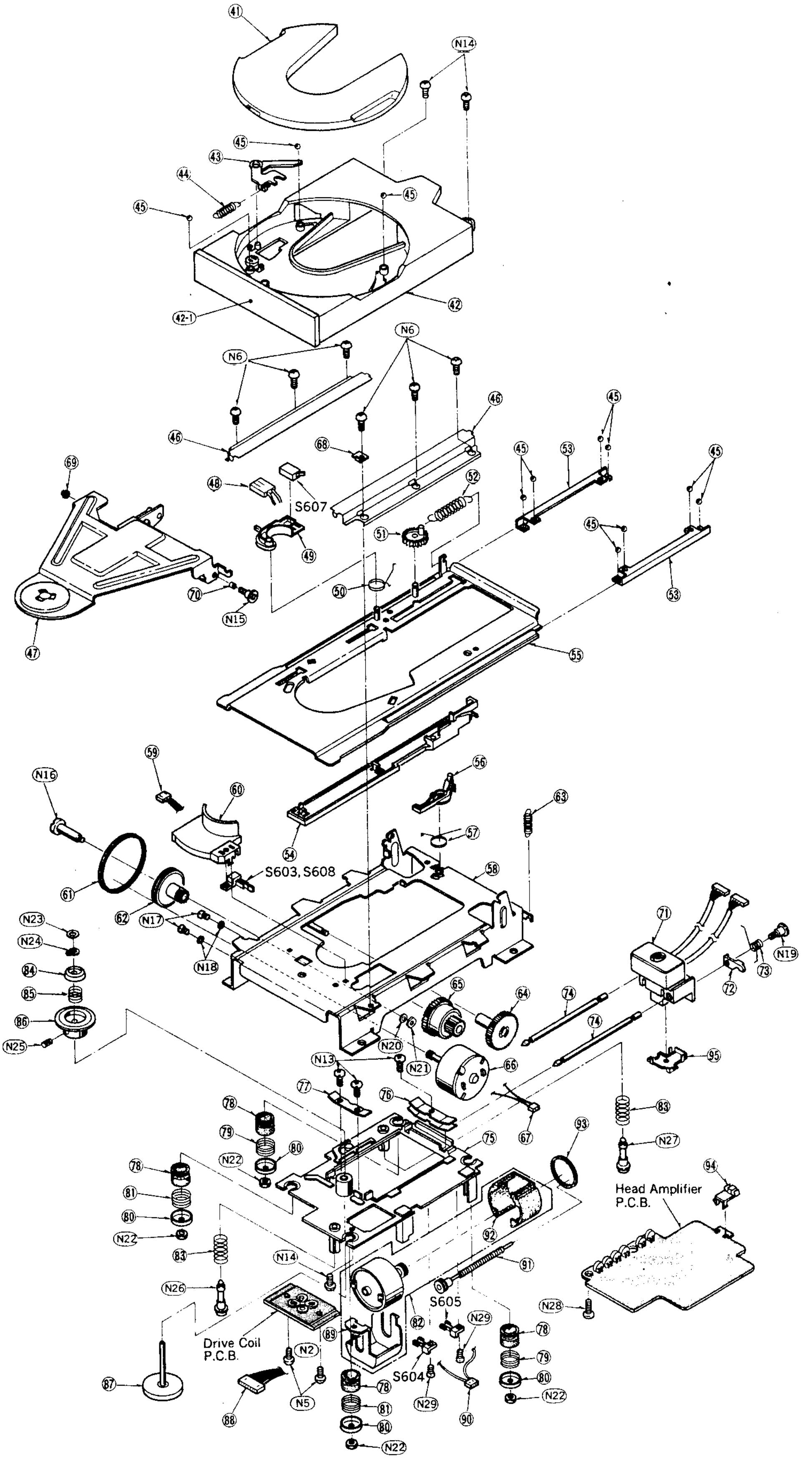
■ EXPLODED VIEW

- **Loading drive mechanism and optical deck unit parts**


41
N14
45
43
44
45
45
42-1
42
N6
N6
46
46
68
45
53
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69
48
S607
52
51
49
45
45
53
50
70
N15
47
55
N16
59
60
56
63
57
61
54
S603, S608
58
62
N17
N23
N24
N18
71
N19
84
73
72
85
65
64
74
86
74
N25
N20
N21
95
N13
66
77
76
67
78
83
79
75
93
N22
80
N27
78
94
Head Amplifier P.C.B.
81
92
80
N22
83
N14
91
N26
S605
N28
82
N29
78
Drive Coil P.C.B.
N2
89
79
S604
80
87
78
N22
81
88
N5
N29
90
80
N22

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Technical Guide

VOL. 2

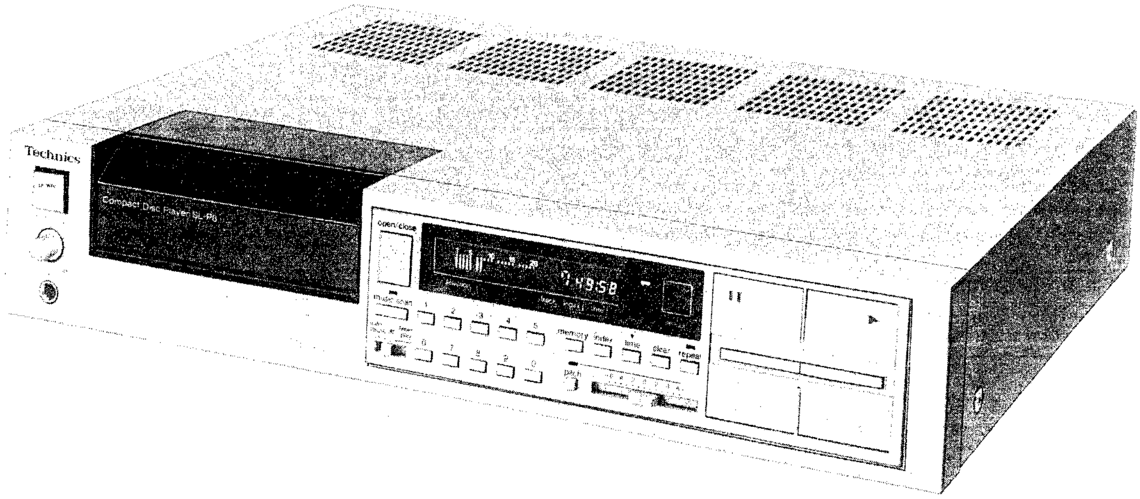
TROUBLE SHOOTING

Compact Disc Player

SL-P8

COMPACT disc DIGITAL AUDIO

DIGITAL


Technics
Compact Disc Player SL-P8
open/close
memory
index
clear
repeat

Technics

MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
DISC AUDIO DIVISION

555

FOREWORD

This trouble shooting is intended to be used for seminars and selfstudies in Combination with the trouble shooting of SL-7. Therefore those Common to SL-P7 are omitted.

Accordingly, main differences from SL-P7 are involved.

1. Remote Control system and Expanded function of Operation Control.
2. Pitch Control.
3. Expansion of Display function.

These trouble shooting are described in 3 chapters, and other related circuit are omitted, So refer to the trouble shooting of SL-P7 and adjustment manual of SL-P8.

CONTENTS

Page

[1] Outlines of Trouble Shooting 1

[2] Circuit Configuration 2

[3] Block Diagram of Signal Line and Main roles 4

[4] How to check Power Supply Circuit (Firstable check the Power supply circuit before check the other circuit) 6

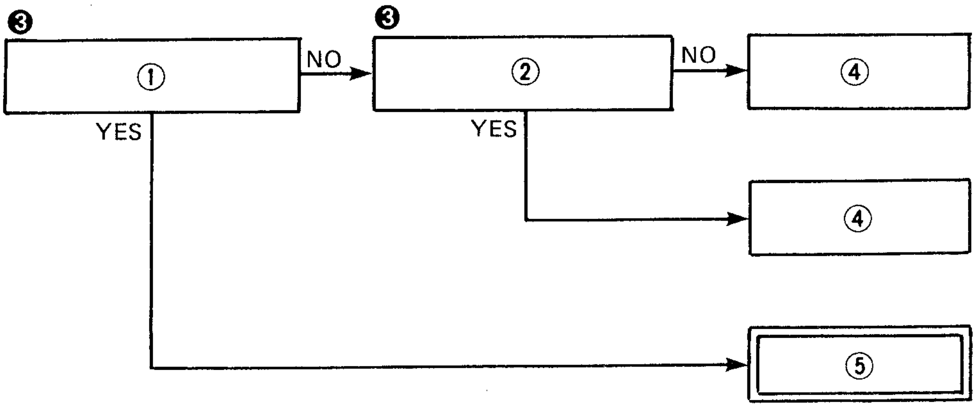
[5] How to Check Remote and Operation Control System 9

[6] How to Check Pitch Control Circuit 15

[7] How to Check Display Circuit 23

[1] Outlines of Trouble Shooting

1-1. Block Diagram
1-2. Signal line and Main roles of each circuit.
1-3. How to use the trouble shooting manual.
- Main roles.
- Main sympton.
- Block diagram
- Items to be confirmed before checking.
  - * Input Signal
  - * Control Signal
  - * Output Signal
- Checking method of each part.

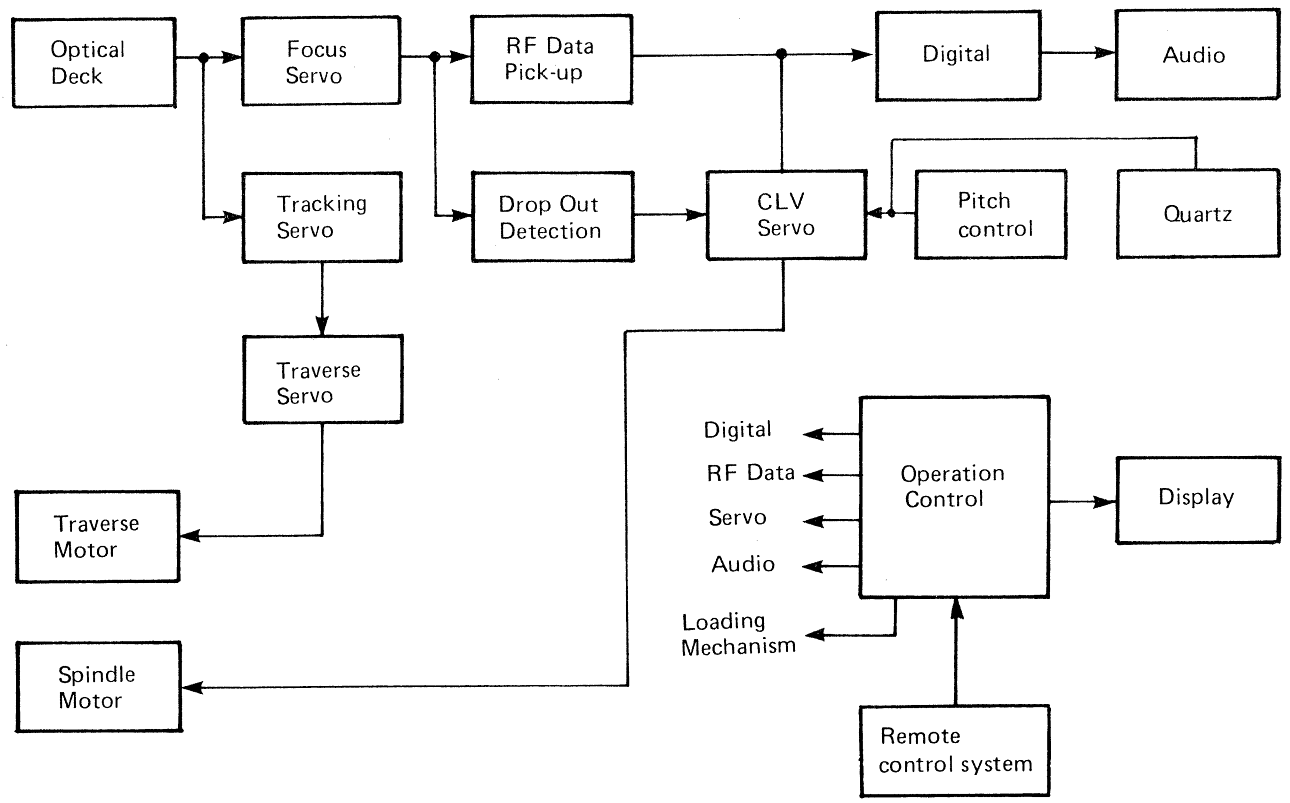


① : Circuti block is checked as a rule.
② : Defective parts which are so predicted are determined.
③ : Waveform and voltage in normal operation are shown.
④ : Defective parts so predicted are written.
P.D. = Possible Defects
A.A.C. = And Associated Components.
⑤ : No problem of this circuit But Re-check the adjustment manual.

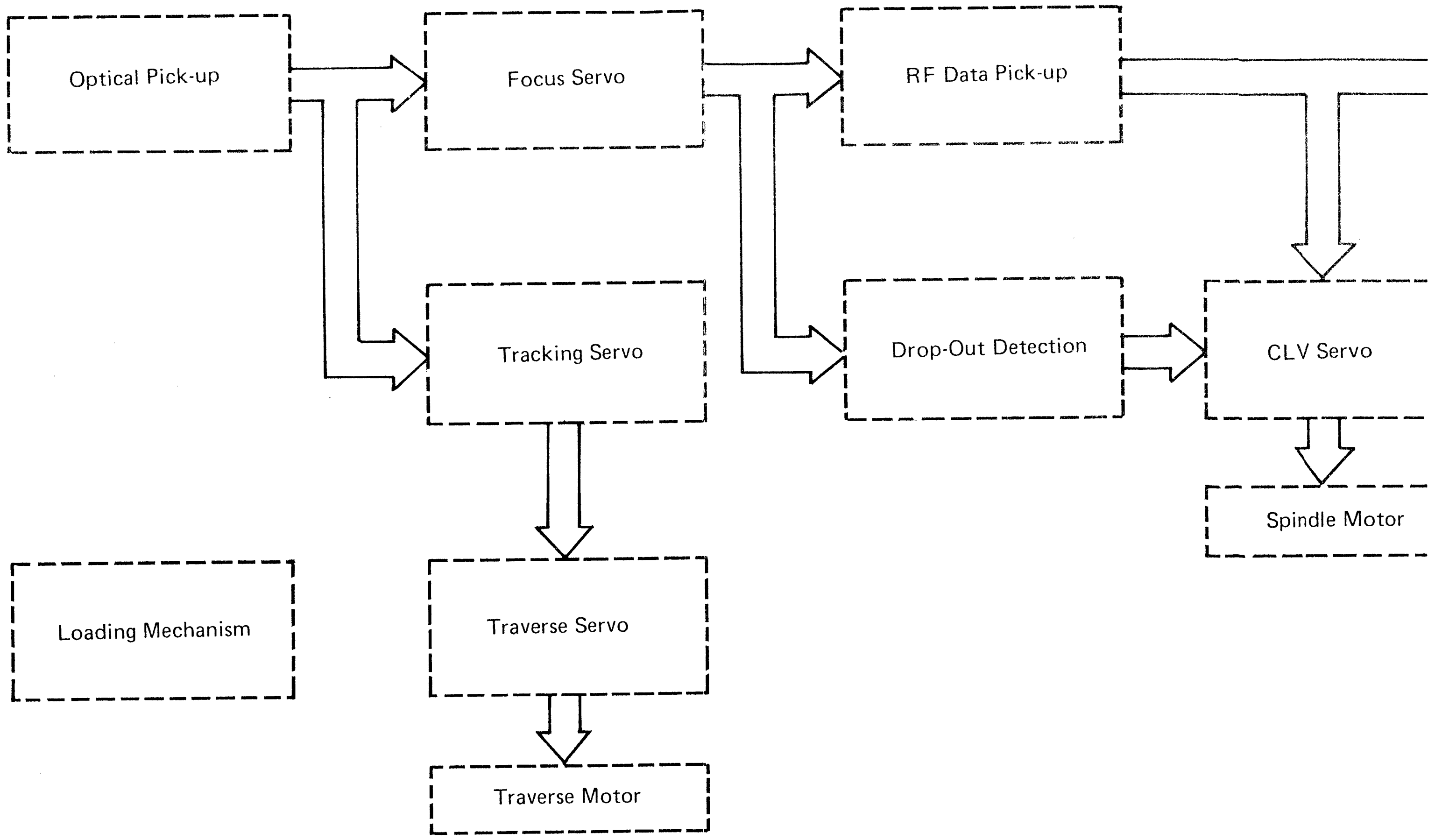
1-4. Table of Contents for Trouble Shooting
(Judge the defected circuit from the Phenomenon of defect)

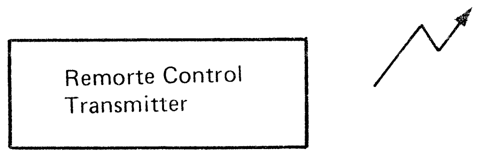
	Operation	Defective Circuit	Refer No.
①	Insert a disc	① Operation Control ② Traverse Circuit ③ Loading Mechanism	

[2] Circuit Configuration


Optical Deck
Focus Servo
RF Data Pick-up
Digital
Audio
Tracking Servo
Drop Out Detection
CLV Servo
Pitch control
Quartz
Traverse Servo
Traverse Motor
Spindle Motor
Digital
RF Data
Servo
Audio
Loading Mechanism
Operation Control
Display
Remote control system

[3] Block Diagram of Signal Line and Main roles


Optical Pick-up
Focus Servo
RF Data Pick-up
Tracking Servo
Drop-Out Detection
CLV Servo
Spindle Motor
Loading Mechanism
Traverse Servo
Traverse Motor

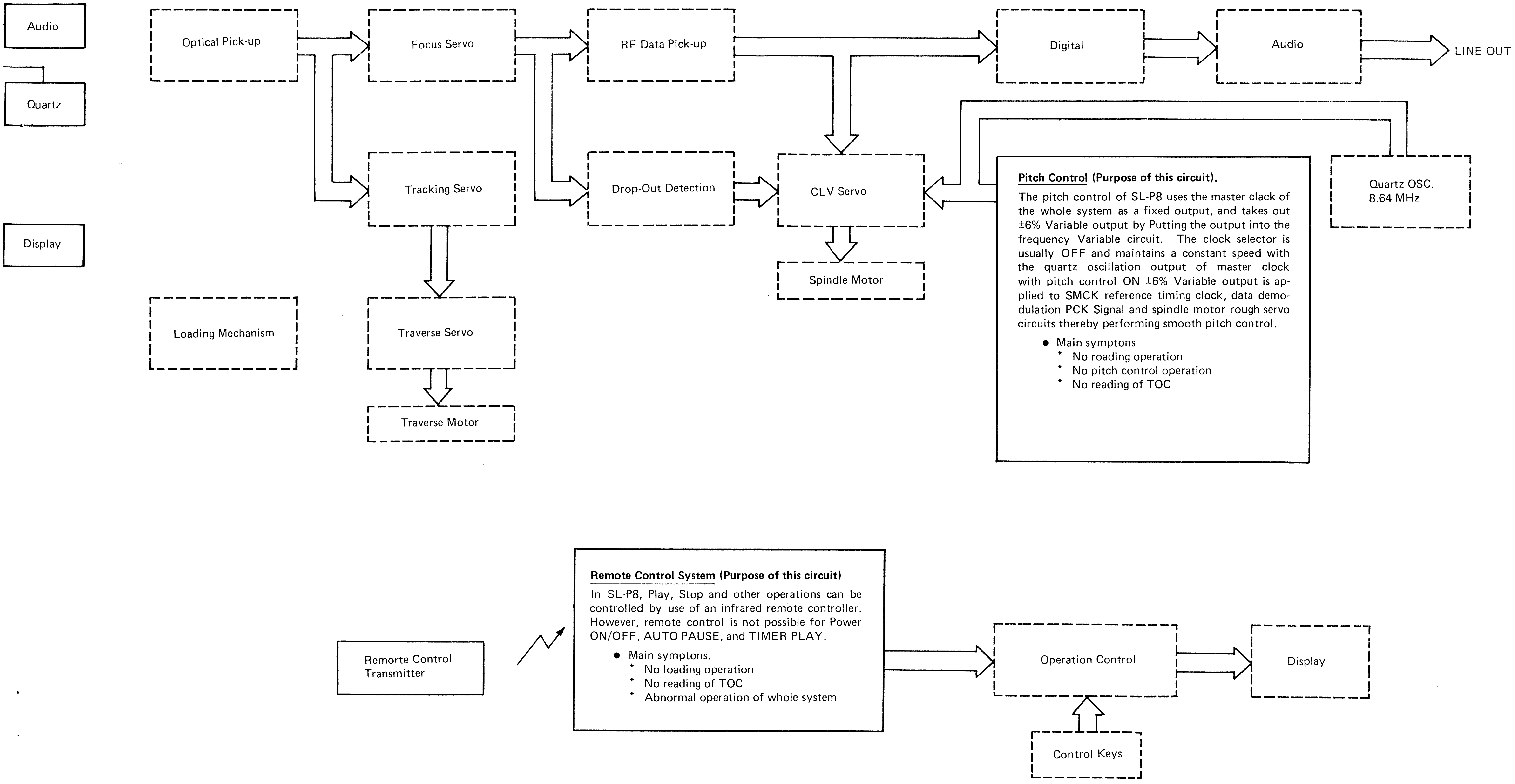

Remorte Control Transmitter

Remote Control System (Purpose of this circuit)

In SL-P8, Play, Stop and other operations can be controlled by use of an infrared remote controller. However, remote control is not possible for Power ON/OFF, AUTO PAUSE, and TIMER PLAY.

- Main symptons.
  - * No loading operation
  - * No reading of TOC
  - * Abnormal operation of whole system

[3] Block Diagram of Signal Line and Main roles


Audio
Quartz
Display
Optical Pick-up
Focus Servo
RF Data Pick-up
Digital
Audio
LINE OUT
Tracking Servo
Drop-Out Detection
CLV Servo
Quartz OSC.
8.64 MHz
Spindle Motor
Loading Mechanism
Traverse Servo
Traverse Motor
Remorte Control
Transmitter
Operation Control
Display
Control Keys

Pitch Control (Purpose of this circuit).

The pitch control of SL-P8 uses the master clack of the whole system as a fixed output, and takes out ±6% Variable output by Putting the output into the frequency Variable circuit. The clock selector is usually OFF and maintains a constant speed with the quartz oscillation output of master clock with pitch control ON ±6% Variable output is applied to SMCK reference timing clock, data demodulation PCK Signal and spindle motor rough servo circuits thereby performing smooth pitch control.

- Main symptons
  - * No roading operation
  - * No pitch control operation
  - * No reading of TOC

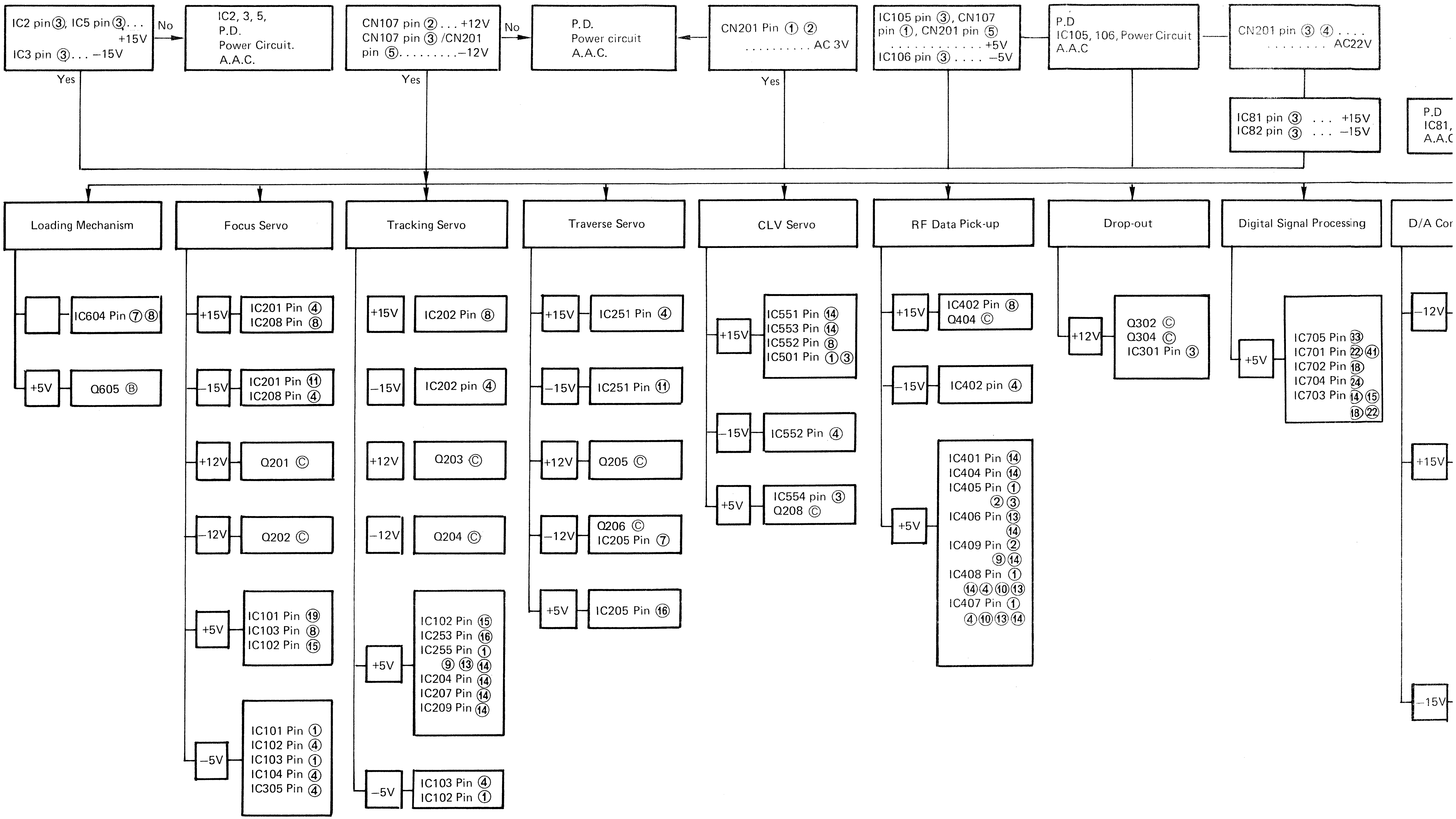
Remote Control System (Purpose of this circuit)

In SL-P8, Play, Stop and other operations can be controlled by use of an infrared remote controller. However, remote control is not possible for Power ON/OFF, AUTO PAUSE, and TIMER PLAY.

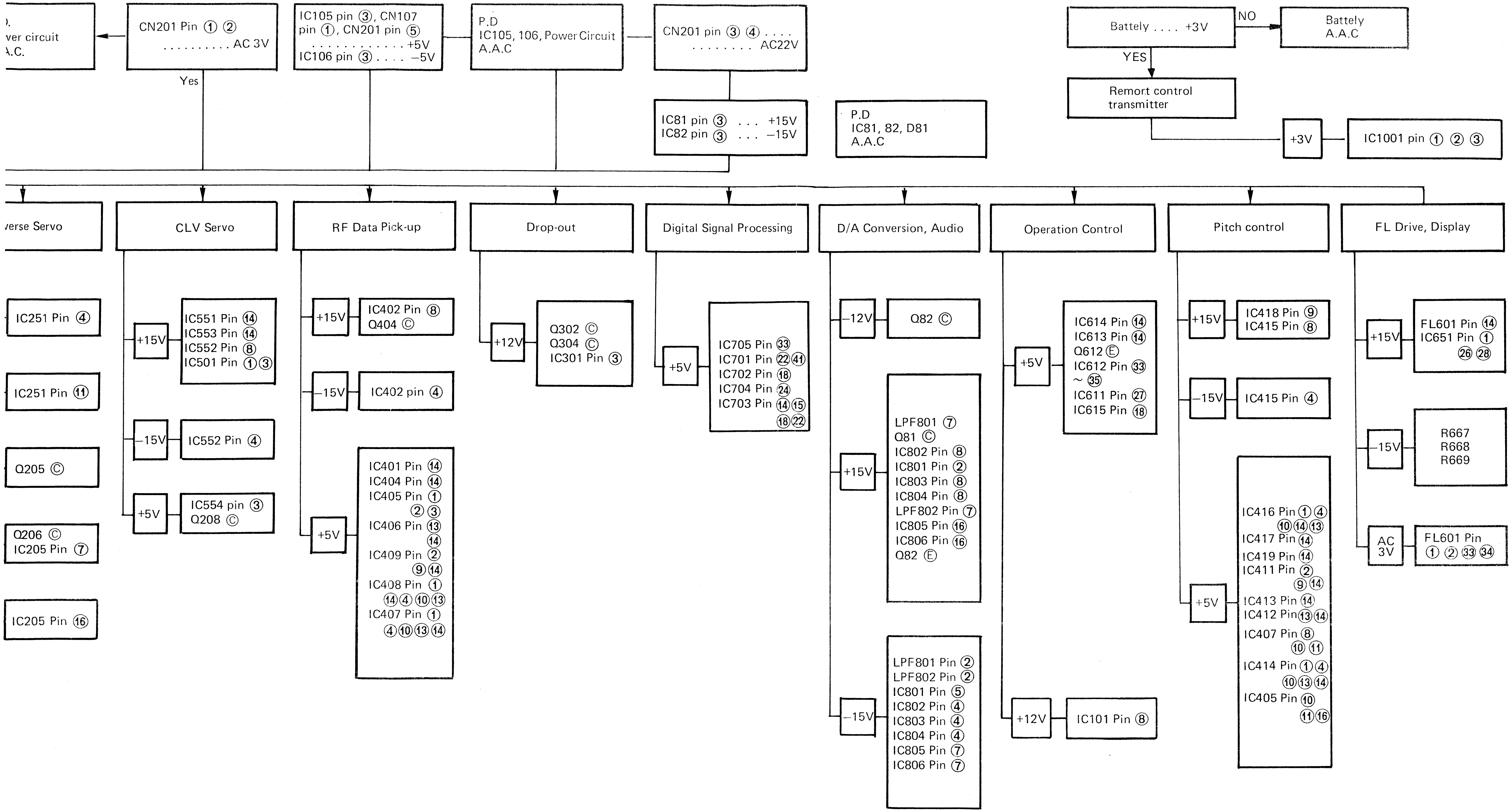
- Main symptons.
  - * No loading operation
  - * No reading of TOC
  - * Abnormal operation of whole system

Mark founctions are informend the SL-P7 trouble shooting manuals.

[4] How to check Power Supply Circuit (Firstable check the Power supply circuit before check the other circuit)


IC2 pin③, IC5 pin③. . . +15V
IC3 pin ③. . . –15V
No
Yes
IC2, 3, 5,
P.D.
Power Circuit.
A.A.C.
CN107 pin ②. . . +12V
CN107 pin ③ /CN201
pin ⑤. . . . .–12V
No
Yes
P.D.
Power circuit
A.A.C.
CN201 Pin ① ②
. . . . AC 3V
Yes
IC105 pin ③, CN107
pin ①, CN201 pin ⑤
. . . . +5V
IC106 pin ③ . . . . –5V
P.D
IC105, 106, Power Circuit
A.A.C
CN201 pin ③ ④ . . . .
. . . . AC22V
IC81 pin ③ . . . +15V
IC82 pin ③ . . . –15V
P.D
IC81,
A.A.C
Loading Mechanism
IC604 Pin ⑦⑧
+5V
Q605 Ⓑ
Focus Servo
+15V
IC201 Pin ④
IC208 Pin ⑧
–15V
IC201 Pin ⑪
IC208 Pin ④
+12V
Q201 Ⓒ
–12V
Q202 Ⓒ
+5V
IC101 Pin ⑲
IC103 Pin ⑧
IC102 Pin ⑮
–5V
IC101 Pin ①
IC102 Pin ④
IC103 Pin ①
IC104 Pin ④
IC305 Pin ④
Tracking Servo
+15V
IC202 Pin ⑧
–15V
IC202 pin ④
+12V
Q203 Ⓒ
–12V
Q204 Ⓒ
+5V
IC102 Pin ⑮
IC253 Pin ⑯
IC255 Pin ①
⑨ ⑬ ⑭
IC204 Pin ⑭
IC207 Pin ⑭
IC209 Pin ⑭
–5V
IC103 Pin ④
IC102 Pin ①
Traverse Servo
+15V
IC251 Pin ④
–15V
IC251 Pin ⑪
+12V
Q205 Ⓒ
–12V
Q206 Ⓒ
IC205 Pin ⑦
+5V
IC205 Pin ⑯
CLV Servo
+15V
IC551 Pin ⑭
IC553 Pin ⑭
IC552 Pin ⑧
IC501 Pin ①③
–15V
IC552 Pin ④
+5V
IC554 pin ③
Q208 Ⓒ
RF Data Pick-up
+15V
IC402 Pin ⑧
Q404 Ⓒ
–15V
IC402 pin ④
+5V
IC401 Pin ⑭
IC404 Pin ⑭
IC405 Pin ①
②③
IC406 Pin ⑬
⑭
IC409 Pin ②
⑨⑭
IC408 Pin ①
⑭④⑩⑬
IC407 Pin ①
④⑩⑬⑭
Drop-out
+12V
Q302 Ⓒ
Q304 Ⓒ
IC301 Pin ③
Digital Signal Processing
+5V
IC705 Pin ㉝
IC701 Pin ㉒㊶
IC702 Pin ⑱
IC704 Pin ㉔
IC703 Pin ⑭⑮
⑱㉒
D/A Cor
–12V
+15V
–15V

ck the Power supply circuit before check the other circuit)


ver circuit
.C.
CN201 Pin ① ②
.... AC 3V
Yes
IC105 pin ③, CN107
pin ①, CN201 pin ⑤
.... +5V
IC106 pin ③ .... –5V
P.D
IC105, 106, Power Circuit
A.A.C
CN201 pin ③ ④ ....
.... AC22V
IC81 pin ③ ... +15V
IC82 pin ③ ... –15V
P.D
IC81, 82, D81
A.A.C
Battely .... +3V
NO
Battely
A.A.C
YES
Remort control
transmitter
+3V
IC1001 pin ① ② ③
verse Servo
IC251 Pin ④
IC251 Pin ⑪
Q205 ©
Q206 ©
IC205 Pin ⑦
IC205 Pin ⑯
CLV Servo
+15V
IC551 Pin ⑭
IC553 Pin ⑭
IC552 Pin ⑧
IC501 Pin ①③
–15V
IC552 Pin ④
+5V
IC554 pin ③
Q208 ©
RF Data Pick-up
+15V
IC402 Pin ⑧
Q404 ©
–15V
IC402 pin ④
+5V
IC401 Pin ⑭
IC404 Pin ⑭
IC405 Pin ①
②③
IC406 Pin ⑬
⑭
IC409 Pin ②
⑨⑭
IC408 Pin ①
⑭④⑩⑬
IC407 Pin ①
④⑩⑬⑭
Drop-out
+12V
Q302 ©
Q304 ©
IC301 Pin ③
Digital Signal Processing
+5V
IC705 Pin ㉝
IC701 Pin ㉒㊶
IC702 Pin ⑱
IC704 Pin ㉔
IC703 Pin ⑭⑮
⑱㉒
D/A Conversion, Audio
–12V
Q82 ©
+15V
LPF801 ⑦
Q81 ©
IC802 Pin ⑧
IC801 Pin ②
IC803 Pin ⑧
IC804 Pin ⑧
LPF802 Pin ⑦
IC805 Pin ⑯
IC806 Pin ⑯
Q82 Ⓔ
–15V
LPF801 Pin ②
LPF802 Pin ②
IC801 Pin ⑤
IC802 Pin ④
IC803 Pin ④
IC804 Pin ④
IC805 Pin ⑦
IC806 Pin ⑦
Operation Control
+5V
IC614 Pin ⑭
IC613 Pin ⑭
Q612 Ⓔ
IC612 Pin ㉝
~ ㉟
IC611 Pin ㉗
IC615 Pin ⑱
+12V
IC101 Pin ⑧
Pitch control
+15V
IC418 Pin ⑨
IC415 Pin ⑧
–15V
IC415 Pin ④
+5V
IC416 Pin ①④
⑩⑭⑬
IC417 Pin ⑭
IC419 Pin ⑭
IC411 Pin ②
⑨⑭
IC413 Pin ⑭
IC412 Pin ⑬⑭
IC407 Pin ⑧
⑩ ⑪
IC414 Pin ①④
⑩⑬⑭
IC405 Pin ⑩
⑪⑯
FL Drive, Display
+15V
FL601 Pin ⑭
IC651 Pin ①
㉖ ㉘
–15V
R667
R668
R669
AC
3V
FL601 Pin
① ② ㉝ ㉞

[5] How to Check Remote and Operation Control System

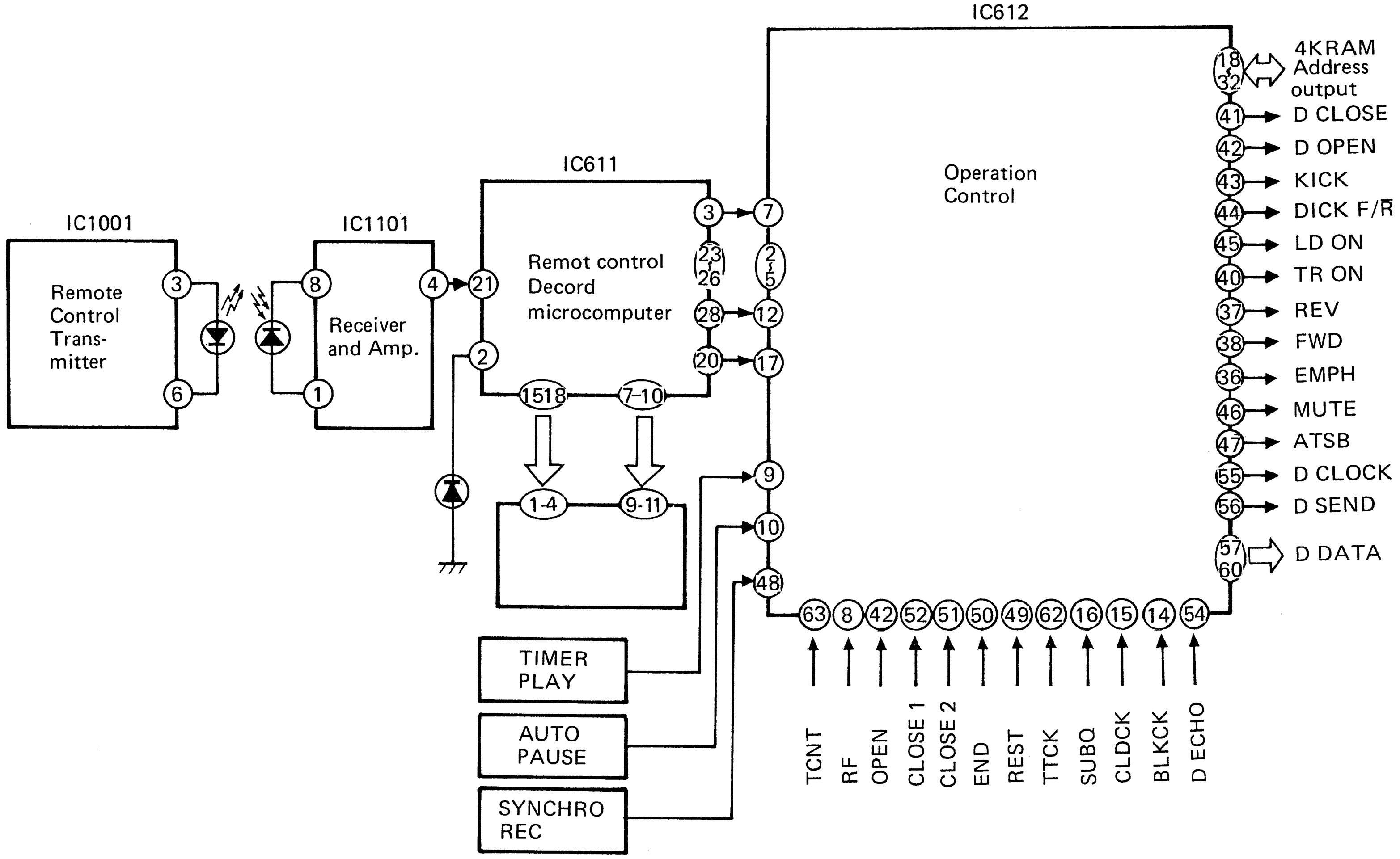
(1) Main roles of remote and operation control circuit

- Setting of each mode
- Remote control of each mode
- Control of whole system

(2) Main symptoms

- No TOC reading
- No loading operation
- Abnormal operation of whole system

(3) Block Diagram


IC612
IC1001
IC1101
IC611
Remote Control Trans-mitter
Receiver and Amp.
Remot control Decord microcomputer
Operation Control
TIMER PLAY
AUTO PAUSE
SYNCHRO REC
4KRAM Address output
D CLOSE
D OPEN
KICK
DICK F/R̄
LD ON
TR ON
REV
FWD
EMPH
MUTE
ATSB
D CLOCK
D SEND
D DATA
TCNT
RF
OPEN
CLOSE 1
CLOSE 2
END
REST
TTCK
SUBQ
CLDCK
BLKCK
D ECHO
3
6
8
1
4
21
2
3
23~26
28
20
1518
7-10
1-4
9-11
7
2~5
12
17
9
10
48
63
8
42
52
51
50
49
62
16
15
14
54
18~32
41
42
43
44
45
40
37
38
36
46
47
55
56
57~60

(4) Items to be confirmed before checking

(Input signal)

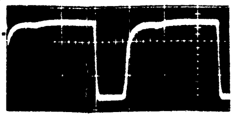
㉛ • D1007 (D1008) . . . . Check infrared LED ON.

(Control signal)

❶ • IC611 Pin ⑮ – ⑱ . . . . .Scan pulse "‾|_|‾"
❷ • IC612 Pin (54) (DECHO) . . . . . Check by display circuit.
❸ • IC612 Pin ⑭ (BLKCK) . . . . .
❹ • IC612 Pin ⑮ (CLDCK) . . . . . Check by digital signal processing circuit.
❺ • IC612 Pin ⑯ (SUBQ) . . . . . .
❻ • IC612 Pin (62) (TTCK) . . . . . . .Check by pitch control circuit.
❼ • IC612 Pin ㊾ (REST) . . . .
❽ • IC612 Pin ㊿ (END) . . . .
❾ • IC612 Pin (51) (CLOSE2) . . . . Check by Loading mechanism.
❿ • IC612 Pin (52) (CLOSE1) . . . .
⓫ • IC612 Pin (53) (OPEN) . . . . . .
⓬ • IC612 Pin ⑧ (RF) . . . . Check by focus servo circuit.
⓭ • IC612 Pin (63) (TCNT) . . . . . . .Check by RF data pick-out circuit.
⓮ • IC612 Pin ⑨ (TIMER PLAY). "L" (Switch ON)
⓯ • IC612 Pin ⑩ (AUTO PAUSE). "L" (Switch ON)
⓰ • IC612 Pin ㊽ (SYNCHRR REC)."L" (Synchro Rec mode)

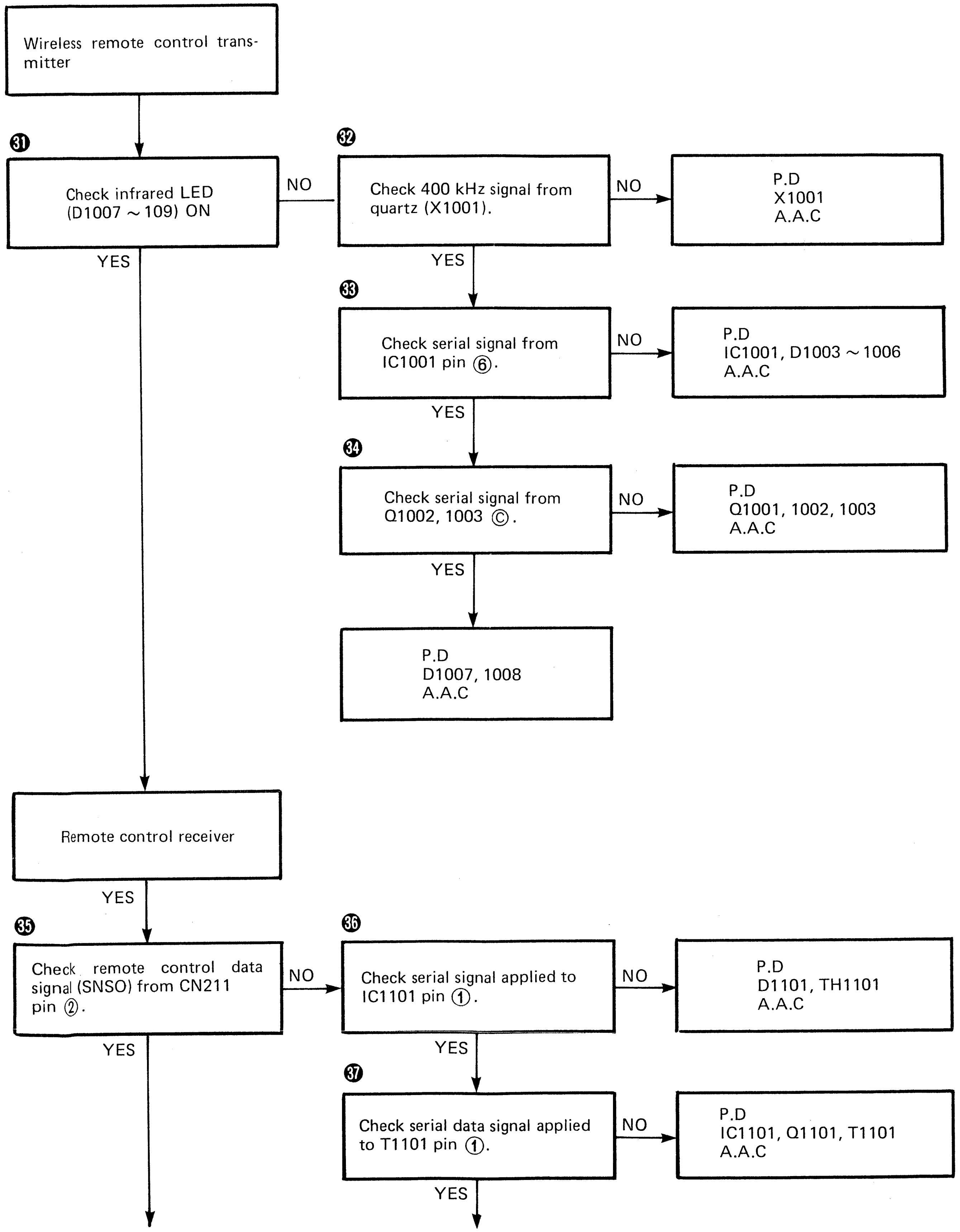
(Output signal)

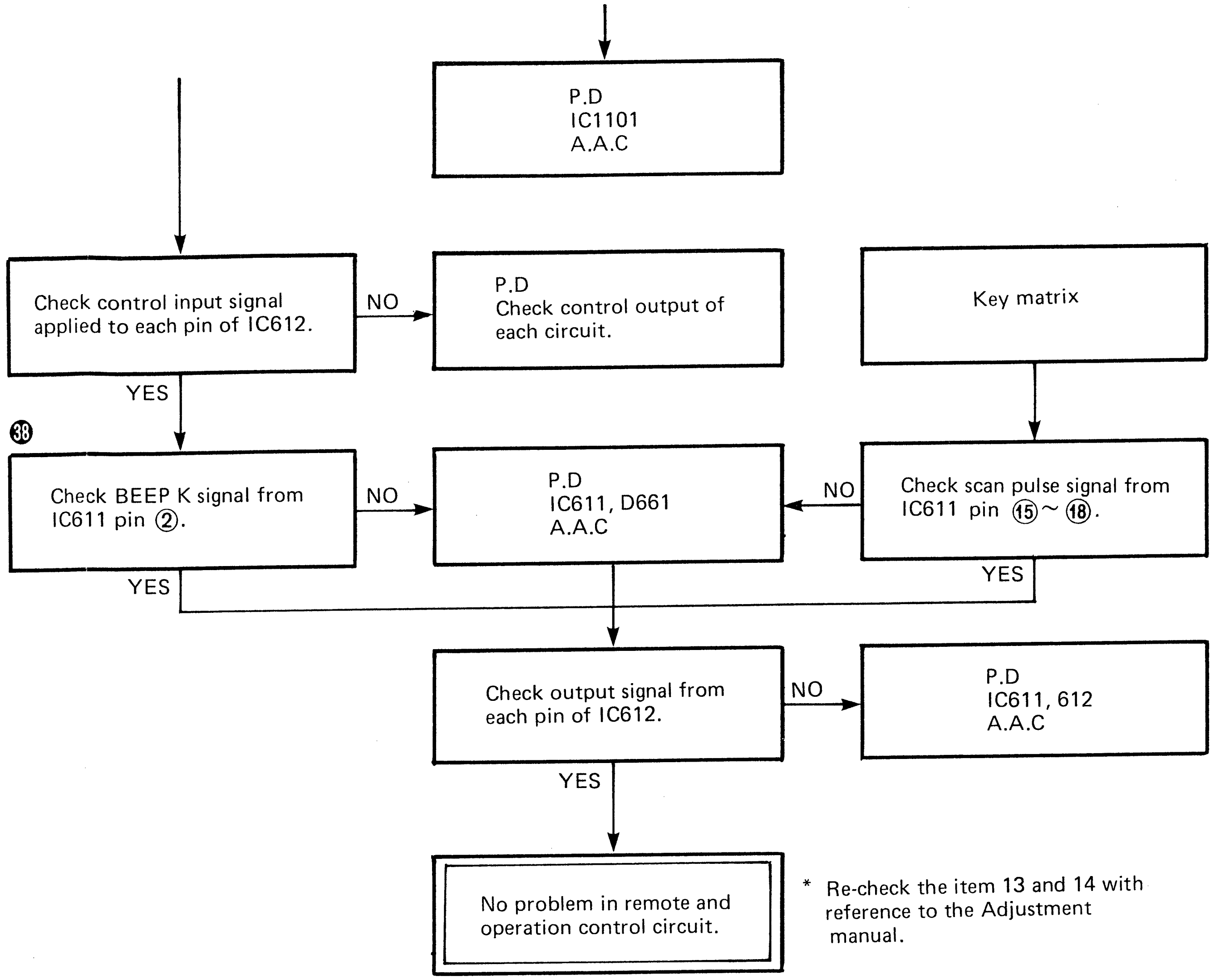
⓱ • IC612 Pin ㊶ (D CLOSE) . . . .
⓲ • IC612 Pin ㊷ (D OPEN) . . . . . Check by loading mechanism.
⓳ • IC612 Pin ㊸ (KICK) . . . .
⓴ • IC612 Pin ㊹ (KICK F/R) . . .
㉑ • IC612 Pin ㊵ (TR ON) . . . . . . Check tracking servo circuit.
㉒ • IC612 Pin ㊺ (LD ON) . . . . . . .Check by focus servo circuit.
㉓ • IC612 Pin ㊲ (REV) . . . . . .
㉔ • IC612 Pin ㊳ (F WD) . . . . Check by traverse servo circuit.
㉕ • IC612 Pin ㊱ (EMPH) . . . . . . .Check by D/A converter/audio circuit.
㉖ • IC612 Pin ㊻ (MUTE) . . . . . .
㉗ • IC612 Pin ㊼ (ATSB) . . . . . . Check by digital signal processing circuit.
㉘ • IC612 Pin (55) (DCLOCK) . . . .
㉙ • IC612 Pin (56) (D SEND) . . . . . Check by display microcomputer circuit.
㉚ • IC612 Pin ⑫ (SYNC) . . . . . .



2V/0.5msec. Div. AC

If all the items mentioned above are satisfied, there is no problem in remote/operation control circuit. If not, you must go to the following procedure.

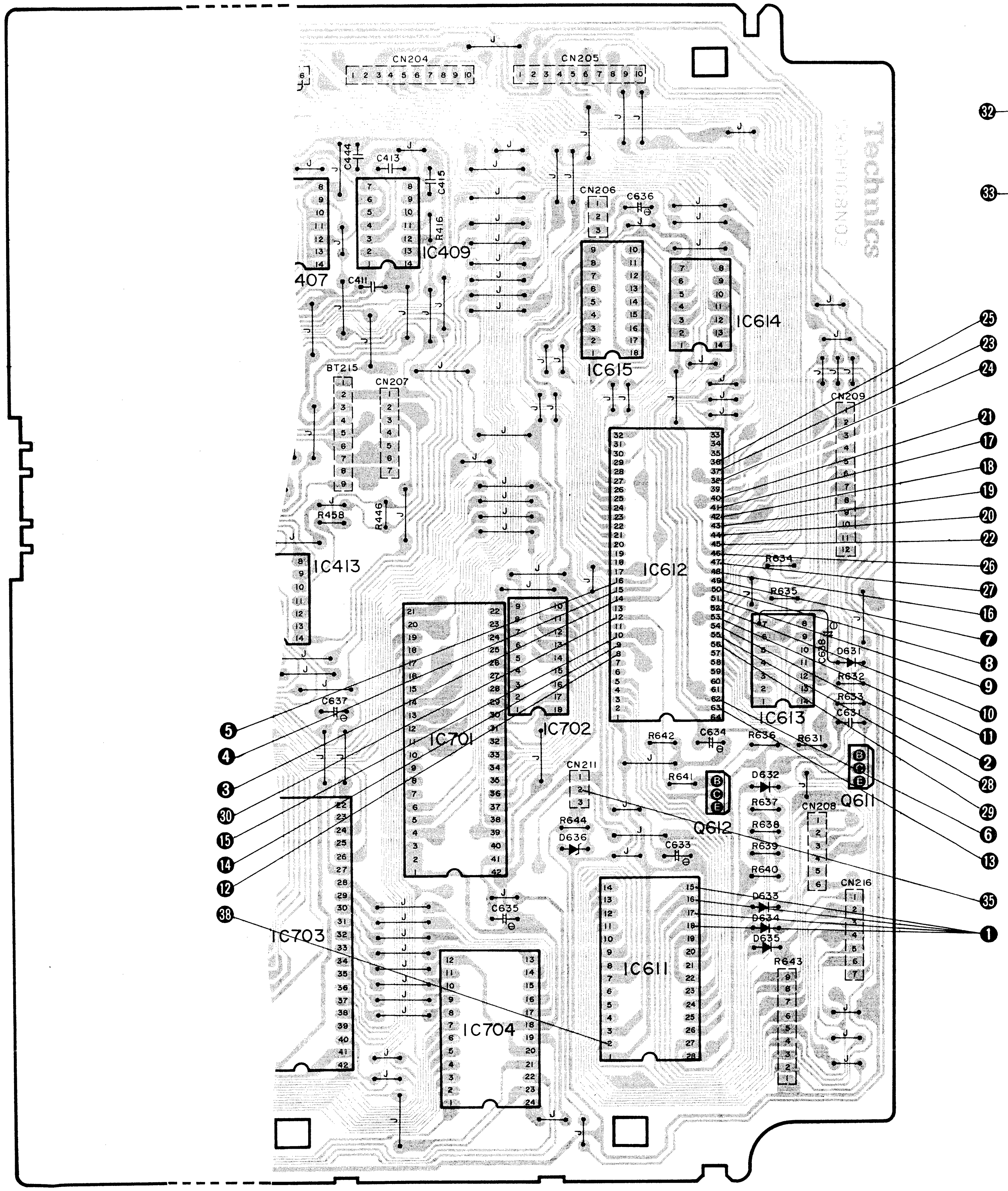

Wireless remote control transmitter
㉛
Check infrared LED (D1007 ~ 109) ON
NO
YES
㉜
Check 400 kHz signal from quartz (X1001).
NO
P.D
X1001
A.A.C
YES
㉝
Check serial signal from IC1001 pin ⑥.
NO
P.D
IC1001, D1003 ~ 1006
A.A.C
YES
㉞
Check serial signal from Q1002, 1003 Ⓒ.
NO
P.D
Q1001, 1002, 1003
A.A.C
YES
P.D
D1007, 1008
A.A.C
Remote control receiver
YES
㉟
Check remote control data signal (SNSO) from CN211 pin ②.
NO
YES
㊱
Check serial signal applied to IC1101 pin ①.
NO
P.D
D1101, TH1101
A.A.C
YES
㊲
Check serial data signal applied to T1101 pin ①.
NO
P.D
IC1101, Q1101, T1101
A.A.C
YES


P.D
IC1101
A.A.C
Check control input signal applied to each pin of IC612.
NO
P.D
Check control output of each circuit.
Key matrix
YES
㊳
Check BEEP K signal from IC611 pin ②.
NO
P.D
IC611, D661
A.A.C
NO
Check scan pulse signal from IC611 pin ⑮ ~ ⑱.
YES
YES
Check output signal from each pin of IC612.
NO
P.D
IC611, 612
A.A.C
YES
No problem in remote and operation control circuit.

* Re-check the item 13 and 14 with reference to the Adjustment manual.

If it is basically not understandable, refer to items 1 ~ 2 in Circuit description.

02 P.C.B.


Technics
CN204
CN205
CN206
CN207
CN208
CN209
CN211
CN216
BT215
IC407
IC409
IC413
IC611
IC612
IC613
IC614
IC615
IC701
IC702
IC703
IC704
Q611
Q612
C411
C413
C415
C444
C631
C633
C634
C635
C636
C637
C638
D631
D632
D633
D634
D635
D636
R416
R446
R458
R631
R632
R633
R634
R635
R636
R637
R638
R639
R640
R641
R642
R643
R644
❶
❷
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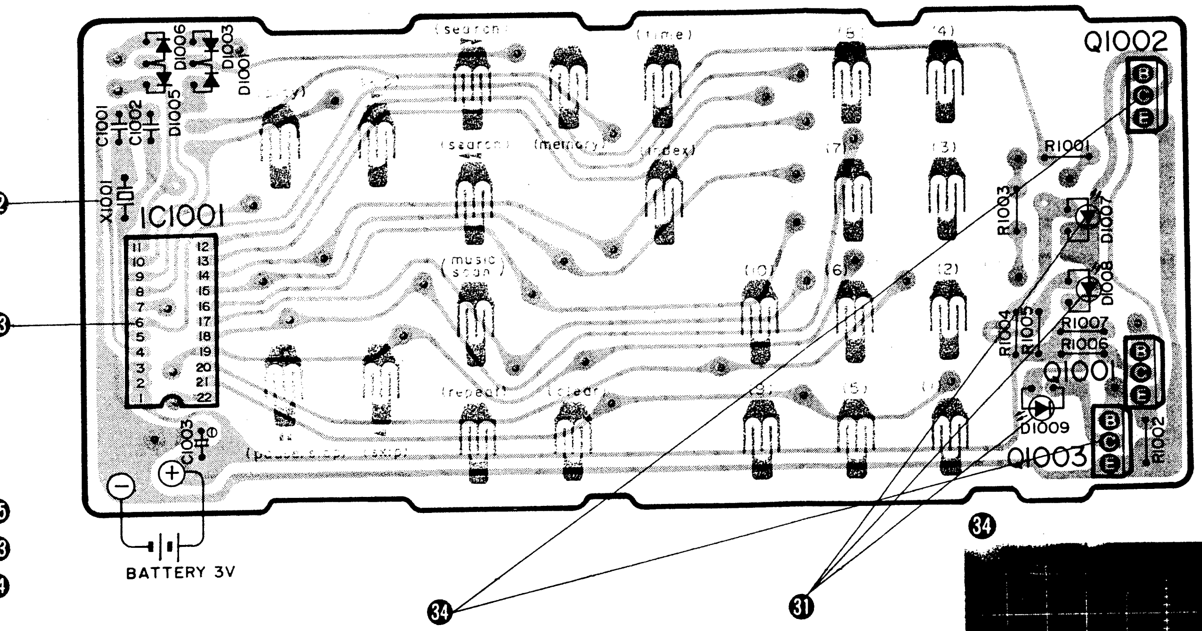
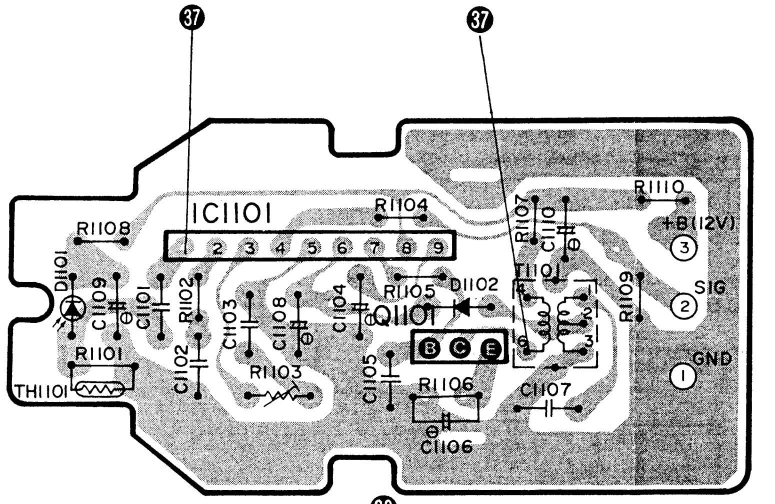
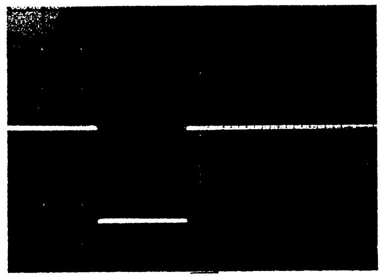

IC1001
X1001
Q1001
Q1002
Q1003
D1001
D1003
D1005
D1006
D1007
D1008
D1009
C1001
C1002
C1003
R1001
R1002
R1003
R1004
R1005
R1006
R1007
(search)
(time)
(memory)
(index)
(music scan)
(repeat)
(clear)
(pause)
BATTERY 3V
㉜
㉝
㉞
㉛

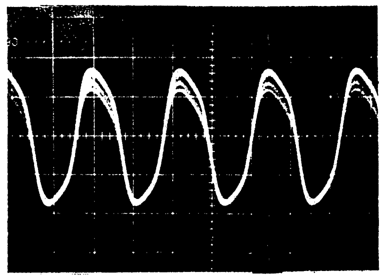

㊲
㊲
IC1101
Q1101
T1101
TH1101
D1101
D1102
R1101
R1102
R1103
R1104
R1105
R1106
R1107
R1108
R1109
R1110
C1101
C1102
C1103
C1104
C1105
C1106
C1107
C1108
C1109
C1110
+B(12V)
SIG
GND

❶



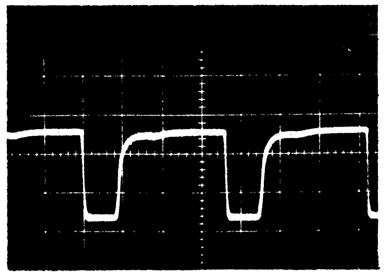
IC601 pin ②
2V/0.1msec. Div. AC

㉚



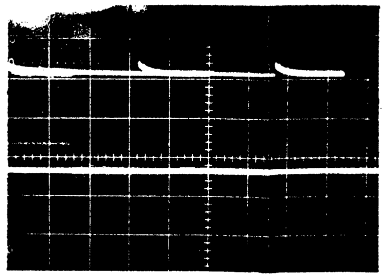
X1001 (IC1001 pin ④) Quartz
1V/1msec. Div. AC

㉛



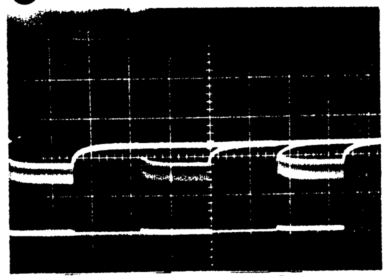
IC612 pin ⑫
2V/0.5msec. Div. AC

㉝



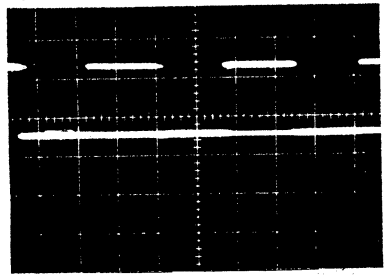
IC1001 pin ⑥
1V/0.5msec. Div. AC

㉞



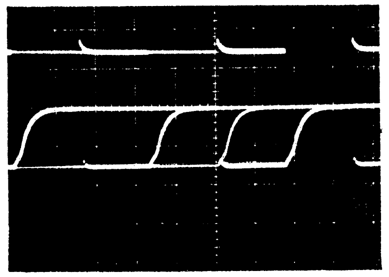
Q1002 Ⓒ /Q1003 Ⓒ
1V/0.5m sec. Div. AC

㉟



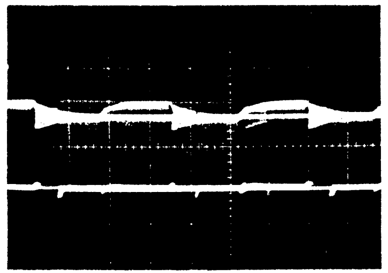
CN211 ②
2V/0.5msec. Div. AC

㊱



IC1101 pin ①
0.5V/0.5msec. Div. AC

㊲



T1101 pin ⑥
5V/0.5msec. Div. AC

[6] How to Check Pitch Control Circuit

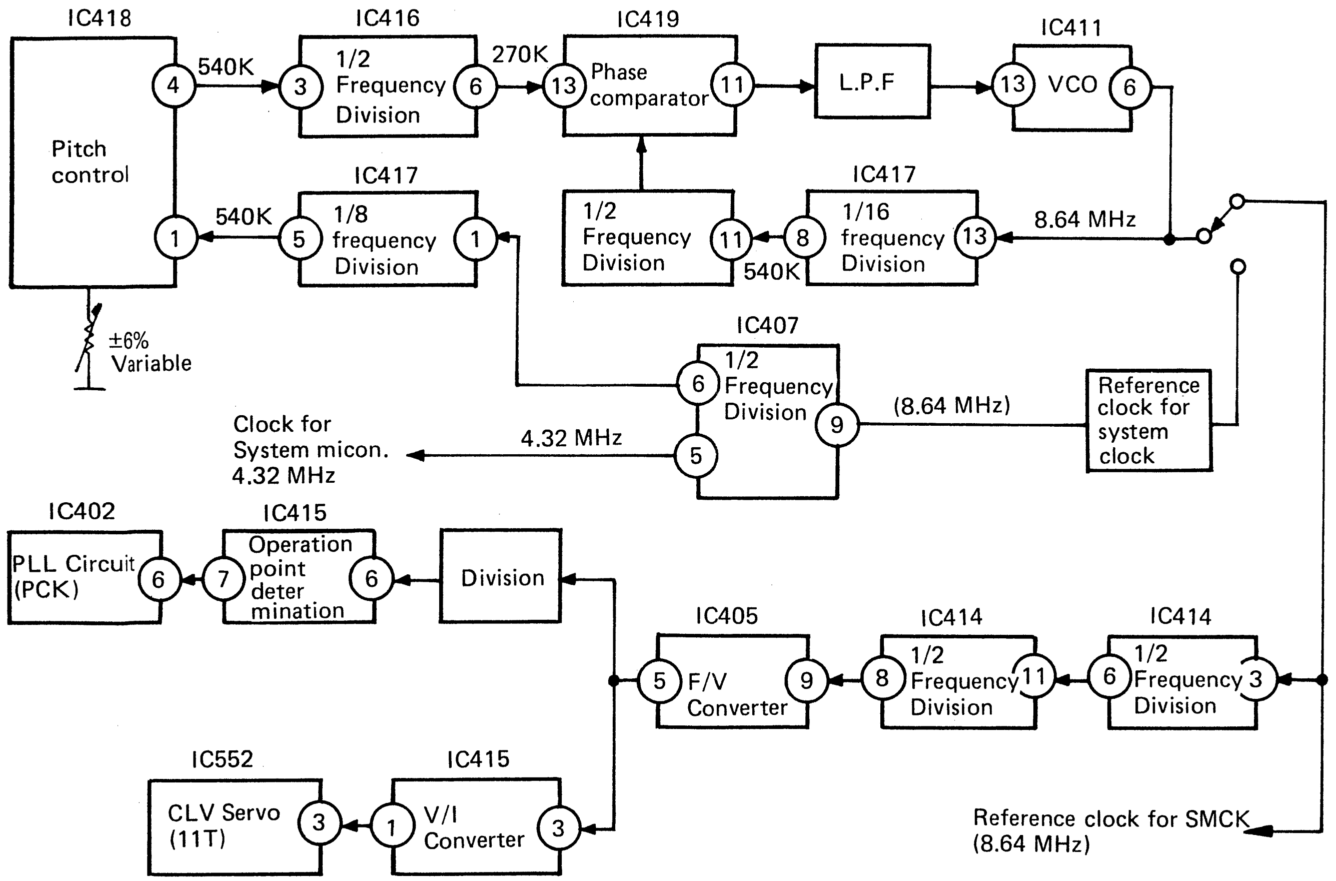
(1) Main roles of pitch control circuit

- It delivers clock (4.32 MHz) output for system control (OSC1).
- It delivers reference timing clock for SMCK.
- It controls data demodulating PCK signal and CLV servo (11T circuit).

(2) Main symptoms

- No TOC reading
- No loading operation

(3) Block diagram


IC418
Pitch control
±6% Variable
540K
IC416
1/2 Frequency Division
270K
IC419
Phase comparator
L.P.F
IC411
VCO
IC417
1/8 frequency Division
540K
1/2 Frequency Division
IC417
1/16 frequency Division
540K
8.64 MHz
IC407
1/2 Frequency Division
(8.64 MHz)
Reference clock for system clock
Clock for System micon. 4.32 MHz
4.32 MHz
IC402
PLL Circuit (PCK)
IC415
Operation point deter mination
Division
IC405
F/V Converter
IC414
1/2 Frequency Division
IC414
1/2 Frequency Division
IC552
CLV Servo (11T)
IC415
V/I Converter
Reference clock for SMCK (8.64 MHz)

(4) Items to be confirmed before checking

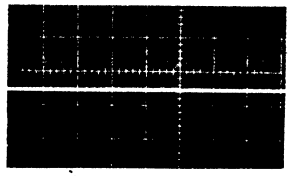
Input signal

- IC412 pin ⑪ (system clock) .... 8.64 MHz.

Output signal

- IC412 pin ⑥ (master colck for SMCK) .... 8.64 MHz
- IC407 pin ⑤ (clock for system control) .... 4.32 MHz

- Q551 © (CLV servo (11T circuit) control signal) ....

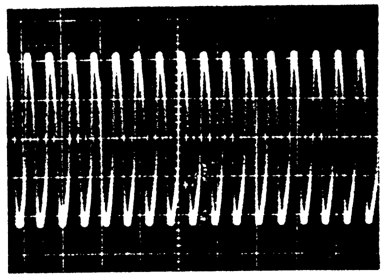


2V/50μsec. Div. AC

- IC402 pin ⑥ (PLL circuit, PCK generation) control signal ..... About DC 3 V

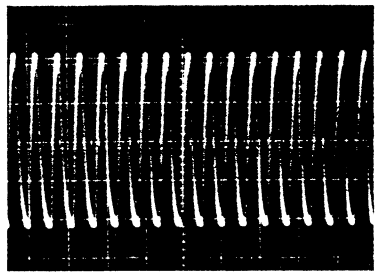
If all the above-mentioned items are satisfied, there is no problem in pitch control circuit. If not, you must go to the following procedure.

❶



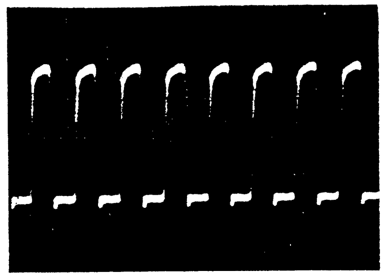
IC412 pin ⑪
1V/0.2msec. Div. AC

❷



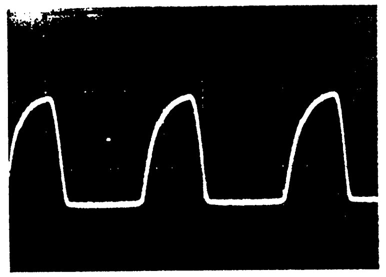
IC412 pin ⑥
1V/0.2msec. Div. AC

❸



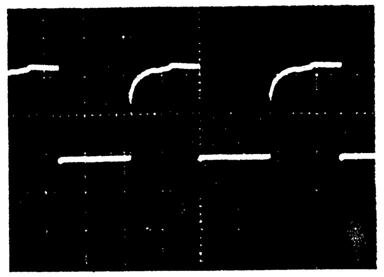
IC407 pin ⑤
1V/0.2sec. Div. AC

❽



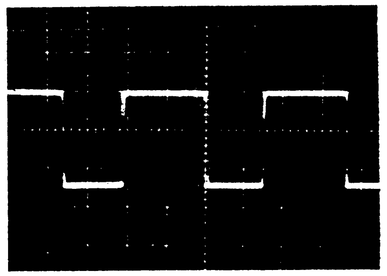
IC418 pin ④
2V/0.5μsec. Div. AC

❾



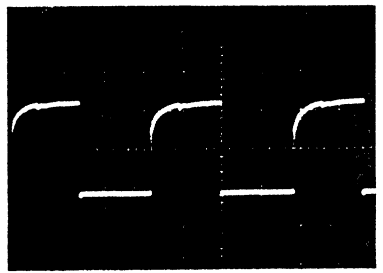
IC416 pin ⑥
2V/1μsec. Div. AC

❺❻❼



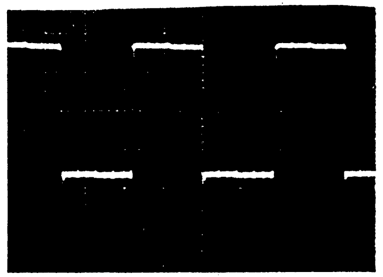
IC417 pin ⑤
1V/0.5μsec. Div. AC

⓬



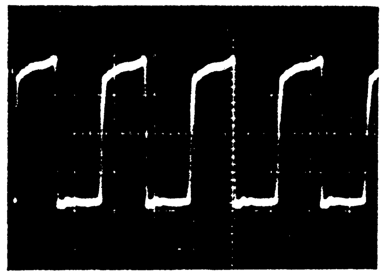
IC416 pin ⑧
2V/1μsec. Div. AC

❿



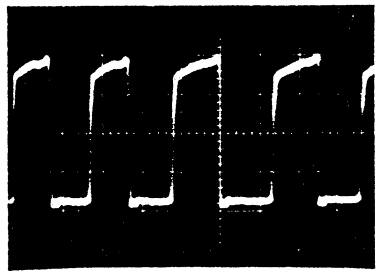
IC419 pin ⑪
2V/0.5μsec. Div. AC

⓰



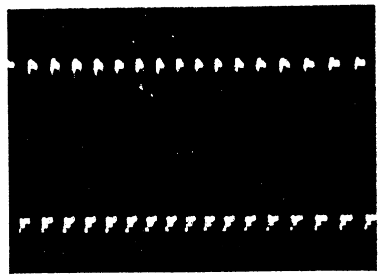
IC414 pin ⑧
1V/0.2μsec. Div. AC

⓰



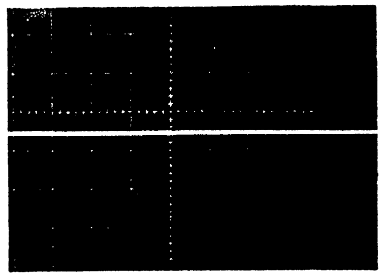
IC414 pin ⑧
1V/0.2μsec. Div. AC

⓫

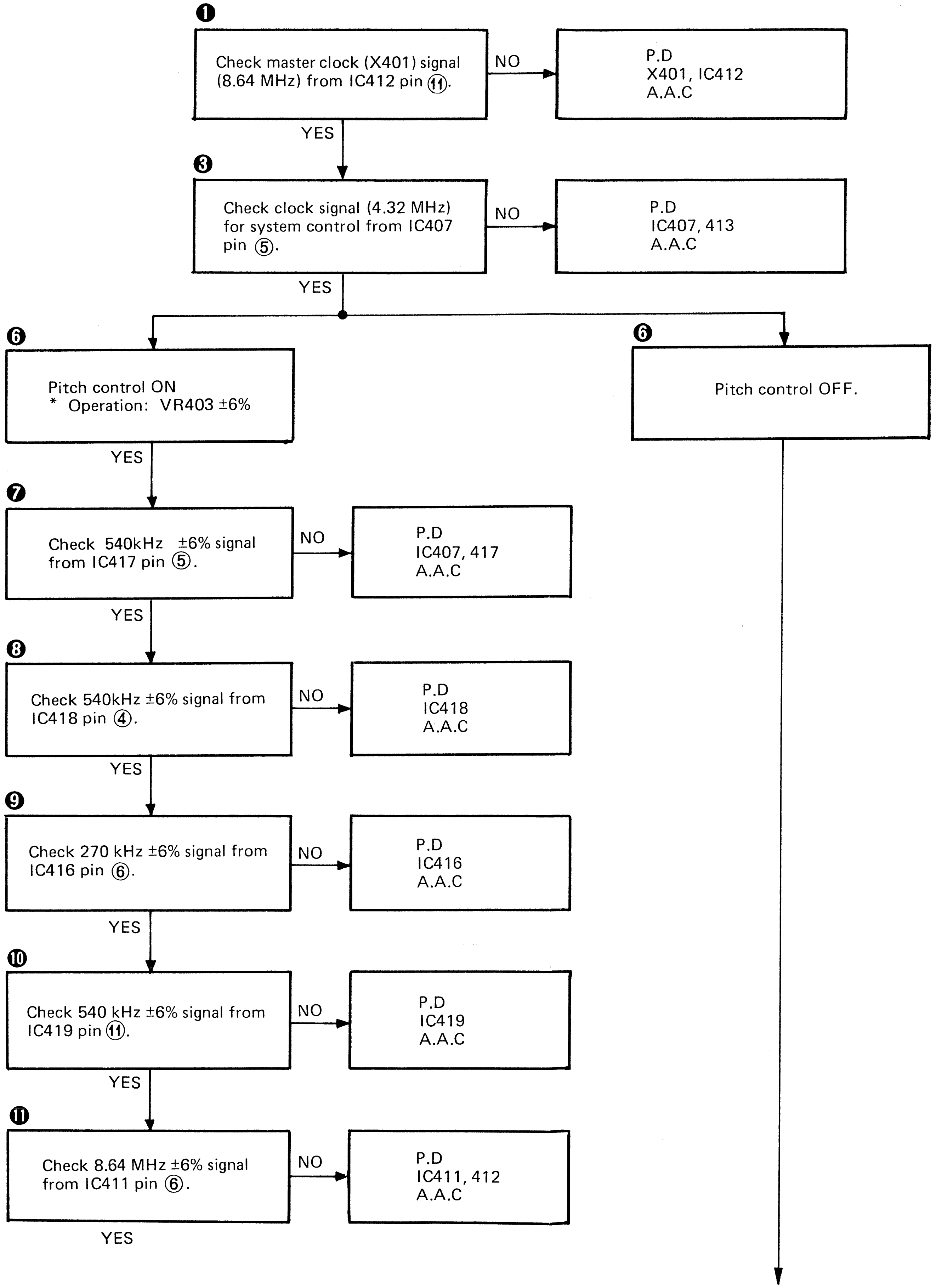


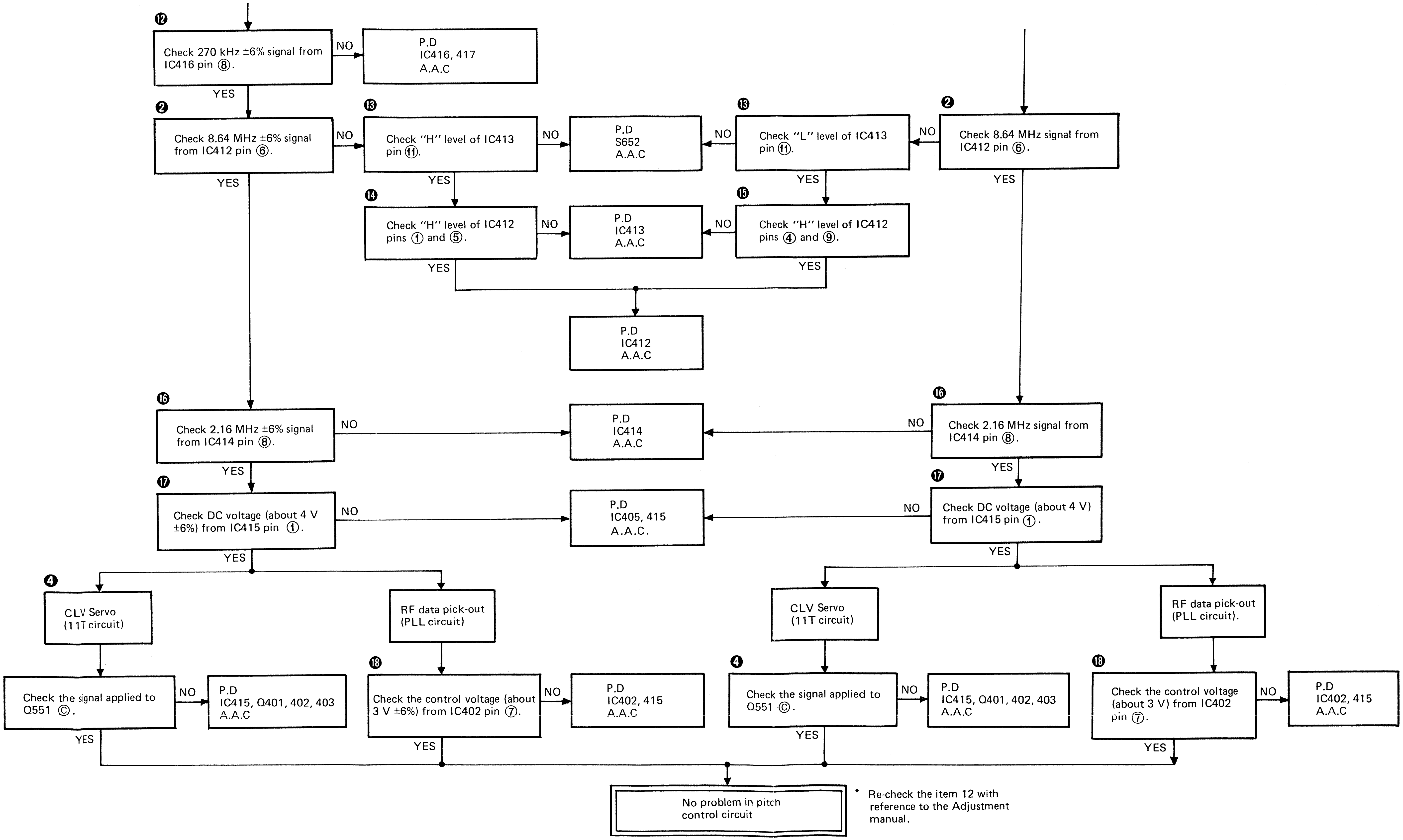
IC411 pin ⑥
1V/0.2μsec. Div. AC

❹



Q551 ©
2V50μsec. Div. AC

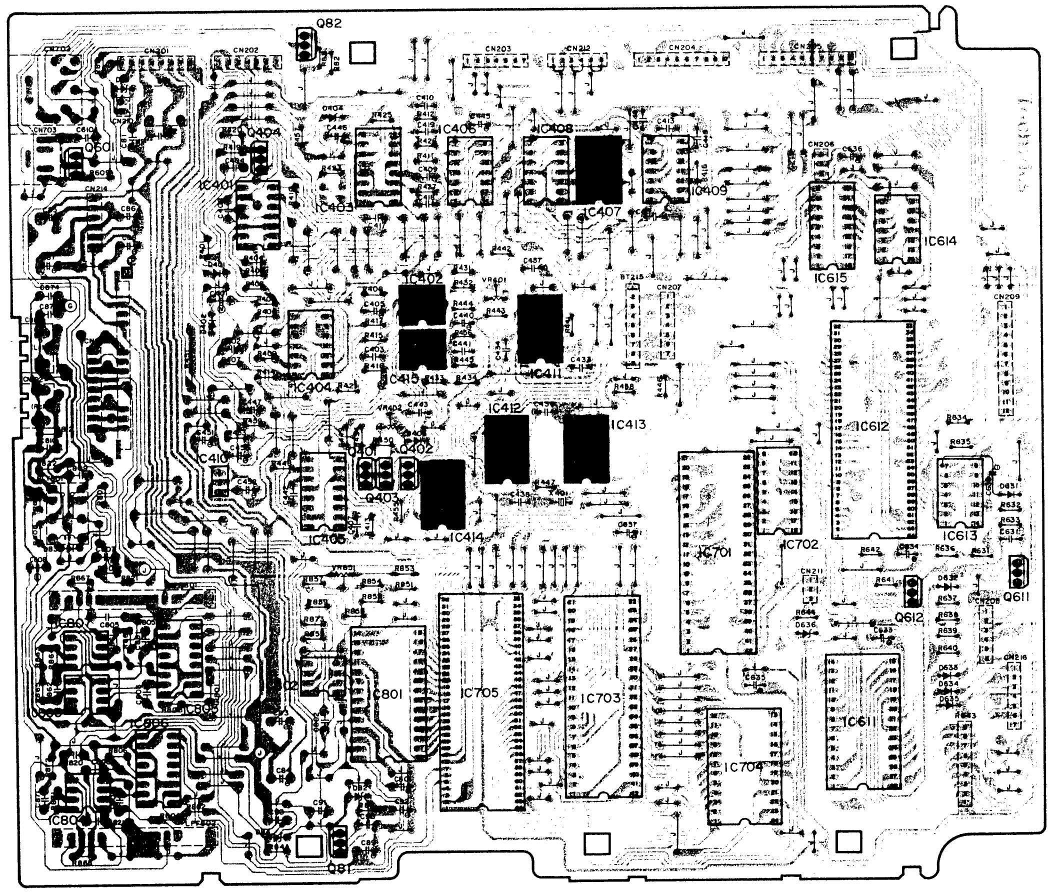

❶
Check master clock (X401) signal (8.64 MHz) from IC412 pin ⑪.
NO
P.D
X401, IC412
A.A.C
YES
❸
Check clock signal (4.32 MHz) for system control from IC407 pin ⑤.
NO
P.D
IC407, 413
A.A.C
YES
❻
Pitch control ON
* Operation: VR403 ±6%
❻
Pitch control OFF.
YES
❼
Check 540kHz ±6% signal from IC417 pin ⑤.
NO
P.D
IC407, 417
A.A.C
YES
❽
Check 540kHz ±6% signal from IC418 pin ④.
NO
P.D
IC418
A.A.C
YES
❾
Check 270 kHz ±6% signal from IC416 pin ⑥.
NO
P.D
IC416
A.A.C
YES
❿
Check 540 kHz ±6% signal from IC419 pin ⑪.
NO
P.D
IC419
A.A.C
YES
⓫
Check 8.64 MHz ±6% signal from IC411 pin ⑥.
NO
P.D
IC411, 412
A.A.C
YES

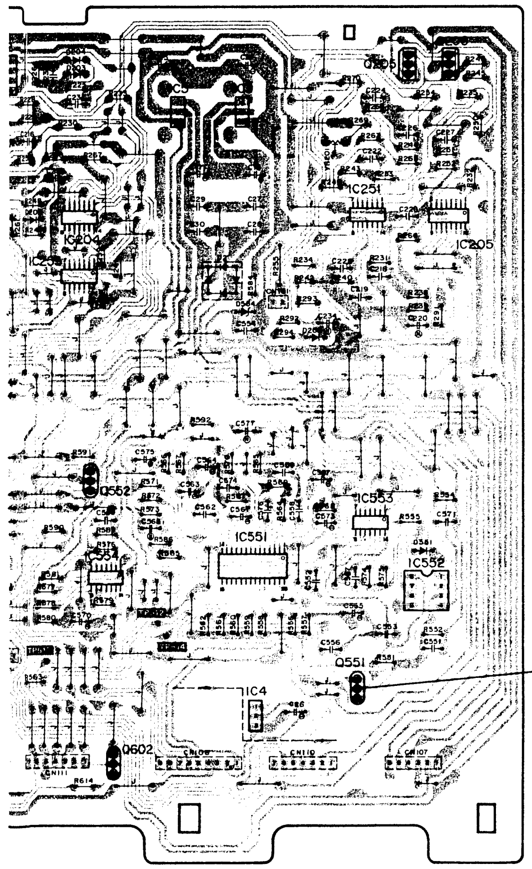

⓬
Check 270 kHz ±6% signal from IC416 pin ⑧.
NO
P.D IC416, 417 A.A.C
YES
❷
Check 8.64 MHz ±6% signal from IC412 pin ⑥.
NO
⓭
Check "H" level of IC413 pin ⑪.
NO
P.D S652 A.A.C
NO
⓭
Check "L" level of IC413 pin ⑪.
NO
❷
Check 8.64 MHz signal from IC412 pin ⑥.
YES
YES
YES
YES
⓮
Check "H" level of IC412 pins ① and ⑤.
NO
P.D IC413 A.A.C
NO
⓯
Check "H" level of IC412 pins ④ and ⑨.
YES
YES
P.D IC412 A.A.C
⓰
Check 2.16 MHz ±6% signal from IC414 pin ⑧.
NO
P.D IC414 A.A.C
NO
⓰
Check 2.16 MHz signal from IC414 pin ⑧.
YES
⓱
Check DC voltage (about 4 V ±6%) from IC415 pin ①.
NO
P.D IC405, 415 A.A.C.
NO
YES
⓱
Check DC voltage (about 4 V) from IC415 pin ①.
YES
YES
❹
CLV Servo (11T circuit)
RF data pick-out (PLL circuit)
CLV Servo (11T circuit)
RF data pick-out (PLL circuit).
Check the signal applied to Q551 ©.
NO
P.D IC415, Q401, 402, 403 A.A.C
YES
⓲
Check the control voltage (about 3 V ±6%) from IC402 pin ⑦.
NO
P.D IC402, 415 A.A.C
YES
❹
Check the signal applied to Q551 ©.
NO
P.D IC415, Q401, 402, 403 A.A.C
YES
⓲
Check the control voltage (about 3 V) from IC402 pin ⑦.
NO
P.D IC402, 415 A.A.C
YES
No problem in pitch control circuit

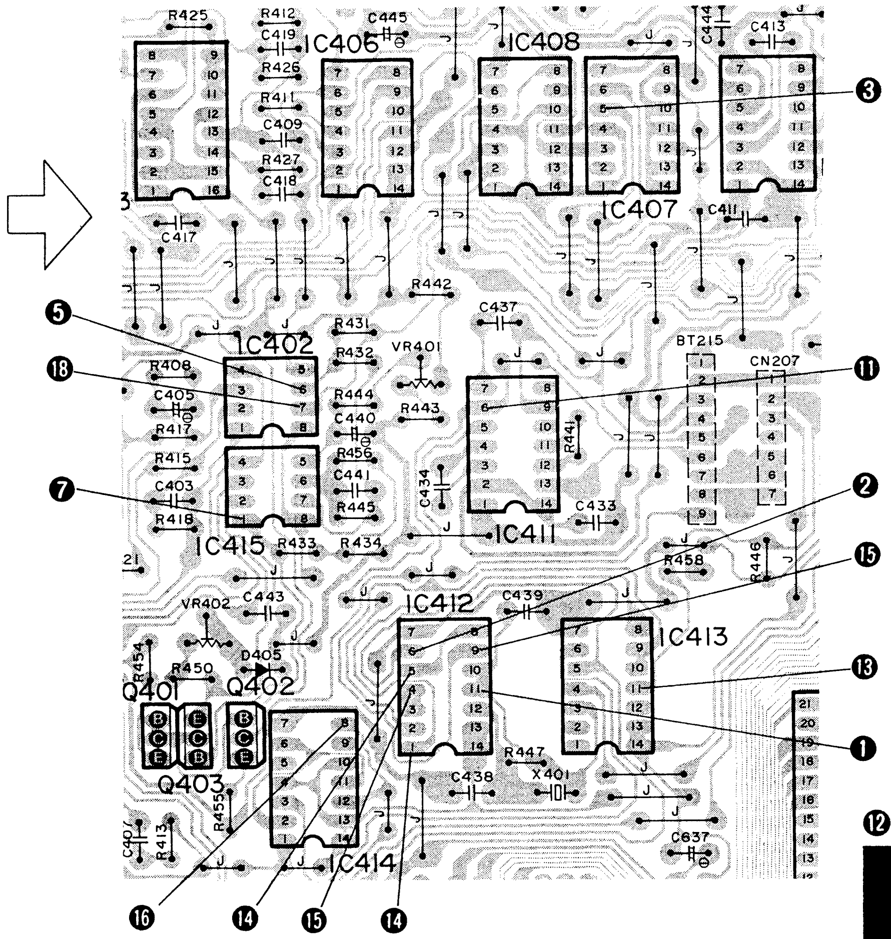
* Re-check the item 12 with reference to the Adjustment manual.

If it is bassically not understandable, refer to item 3 in circuit description.

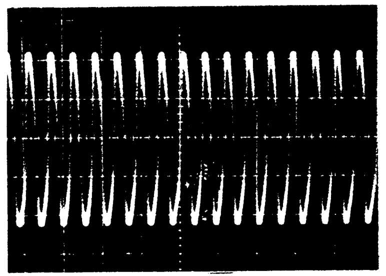
02 P.C.B.


Q82
IC401
IC402
IC404
IC406
IC407
IC408
IC409
IC411
IC412
IC413
IC414
IC415
IC612
IC613
IC614
IC615
IC701
IC702
IC703
IC704
IC705
IC611
IC801
Q601
Q611
Q612
Q81


C251
IC604
IC205
IC551
IC553
IC552
Q551
Q562
Q602
IC4
❹

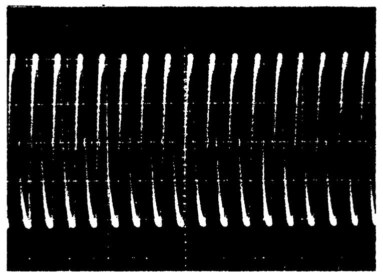

R425
R412
C445
C419
IC406
R426
R411
C409
R427
C418
IC408
IC407
C444
C413
C411
C417
❸
❺
⓲
❼
R442
R431
R432
VR401
C437
BT215
CN207
R408
C405
R417
R415
C403
R418
IC402
IC415
R444
C440
R443
R456
C441
R445
C434
R441
IC411
C433
❶
❷
⓫
⓯
⓭
R433
R434
R458
R446
VR402
C443
IC412
C439
IC413
R454
R450
D405
Q401
Q402
Q403
R453
C401
R413
IC414
R447
C438
X401
C637
⓰
⓮
⓯
⓮

❶



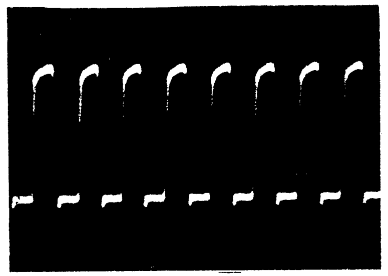
IC412 pin ⑪
1V/0.2msec. Div. AC

❷



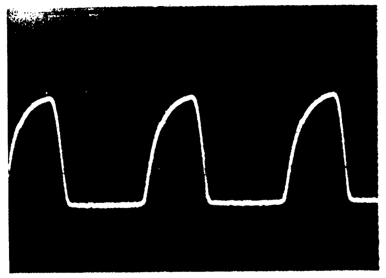
IC412 pin ⑥
1V/0.2msec. Div. AC

❸



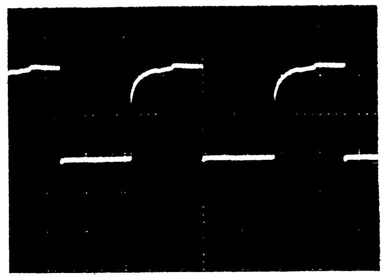
IC407 pin ⑤
1V/0.2sec. Div. AC

❽



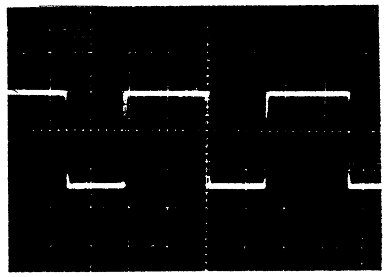
IC418 pin ④
2V/0.5μsec. Div. AC

❾

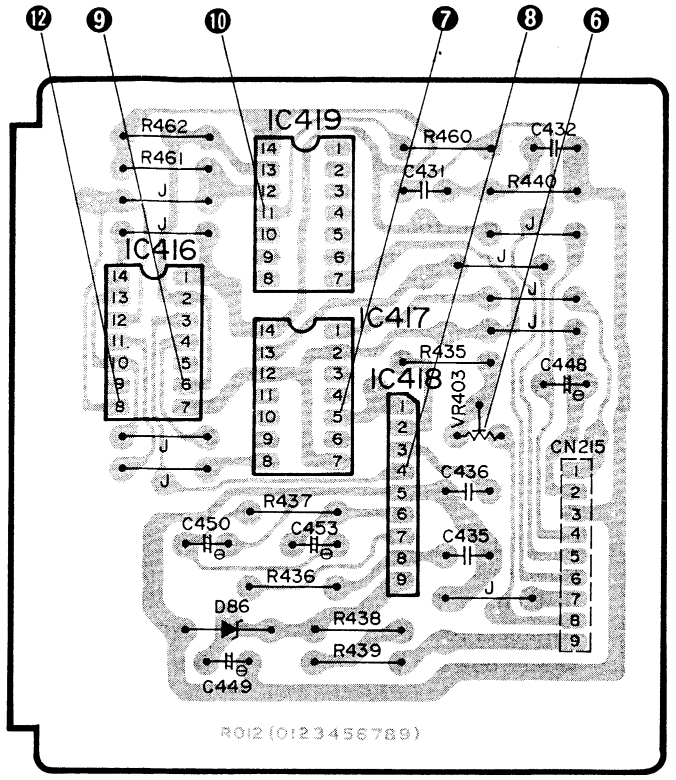


IC416 pin ⑥
2V/1μsec. Div. AC

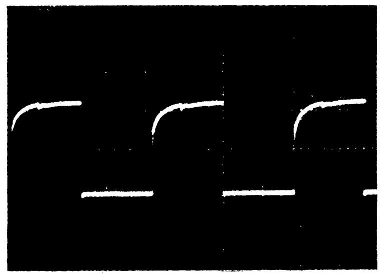
❺❻❼



IC417 pin ⑤
1V/0.5μsec. Div. AC

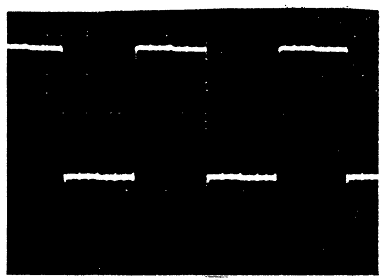

⓬
❾
❿
❼
❽
❻
R462
R461
IC419
R460
C432
C431
R440
IC416
IC417
R435
IC418
VR403
C448
CN215
C436
R437
C450
C453
C435
R436
D86
R438
R439
C449
R012 (0123456789)

⓬



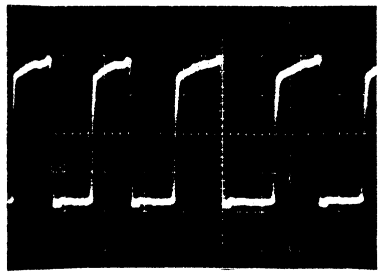
IC416 pin ⑧
2V/1μsec. Div. AC

❿



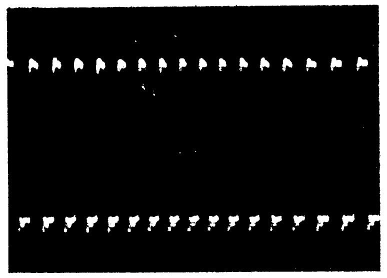
IC419 pin ⑪
2V/0.5μsec. Div. AC

⓰



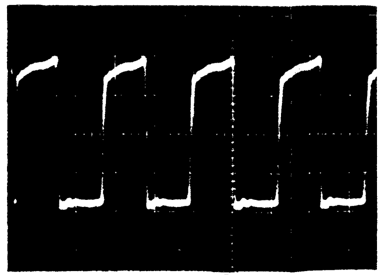
IC414 pin ⑧
1V/0.2μsec. Div. AC

⓫



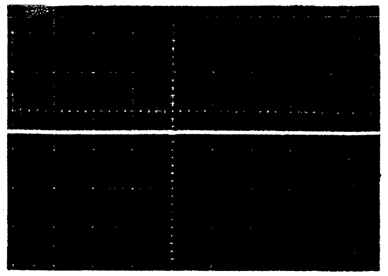
IC411 pin ⑥
1V/0.2μsec. Div. AC

⓰



IC414 pin ⑧
1V/0.2μsec. Div. AC

❹



Q551 Ⓒ
2V50μsec. Div. AC

[7] How to Check Display Circuit

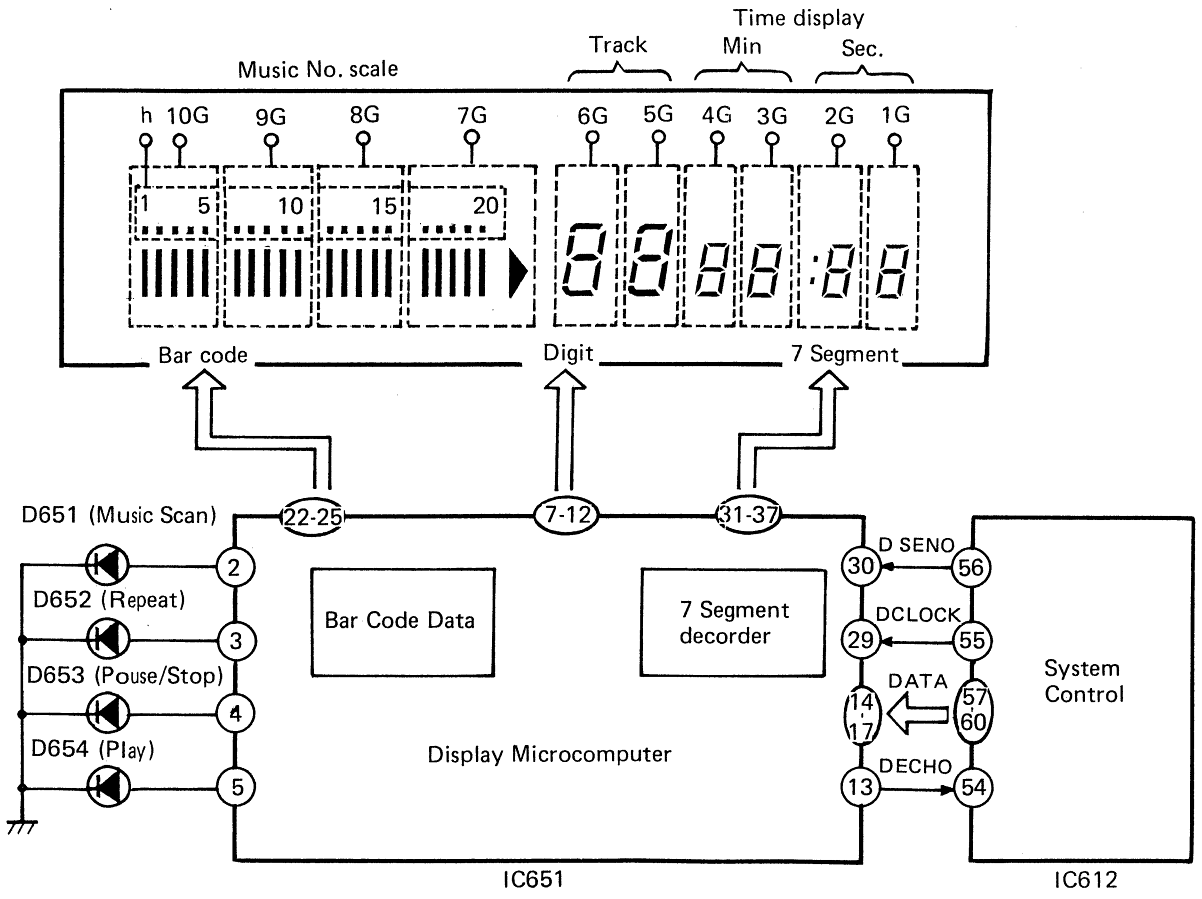
(1) Main roles of display circuit

- It serves to display music No., track, and time.

(2) Main symptoms

- No display at all.
- Abnormal display.

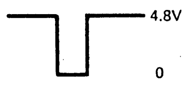
(3) Block diagram


Time display
Music No. scale
Track
Min
Sec.
h 10G
9G
8G
7G
6G
5G
4G
3G
2G
1G
1 5
10
15
20
Bar code
Digit
7 Segment
D651 (Music Scan)
D652 (Repeat)
D653 (Pouse/Stop)
D654 (Play)
22-25
7-12
31-37
2
3
4
5
Bar Code Data
7 Segment decorder
Display Microcomputer
D SENO
30
56
DCLOCK
29
55
DATA
14 17
57 60
DECHO
13
54
System Control
IC651
IC612

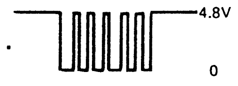
(4) Items to be confirmed before checking

(Input signal)

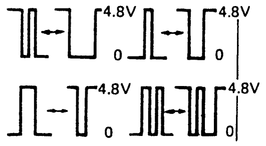
❶ • IC612 Pin (56) (D SEND) ....



❷ • IC612 Pin (55) (D CLOCK) ....

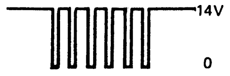


❸ • IC612 Pin (57) – (60) (PB0 – PB3) ....

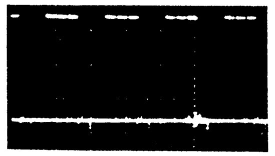

4.8V
0
4.8V
0
4.8V
0
4.8V
0

(Output signal)

❹ • IC651 Pin ⑬ (DECHO) ....

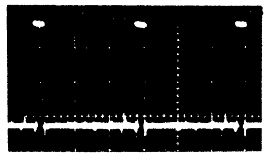


❺ • IC651 Pin ㉛ – ㊲ ....



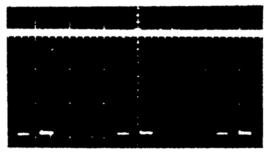
10V/2msec. Div. AC

❻ • IC651 Pin ⑦ – ⑫ ....



10V/1msec. Div.

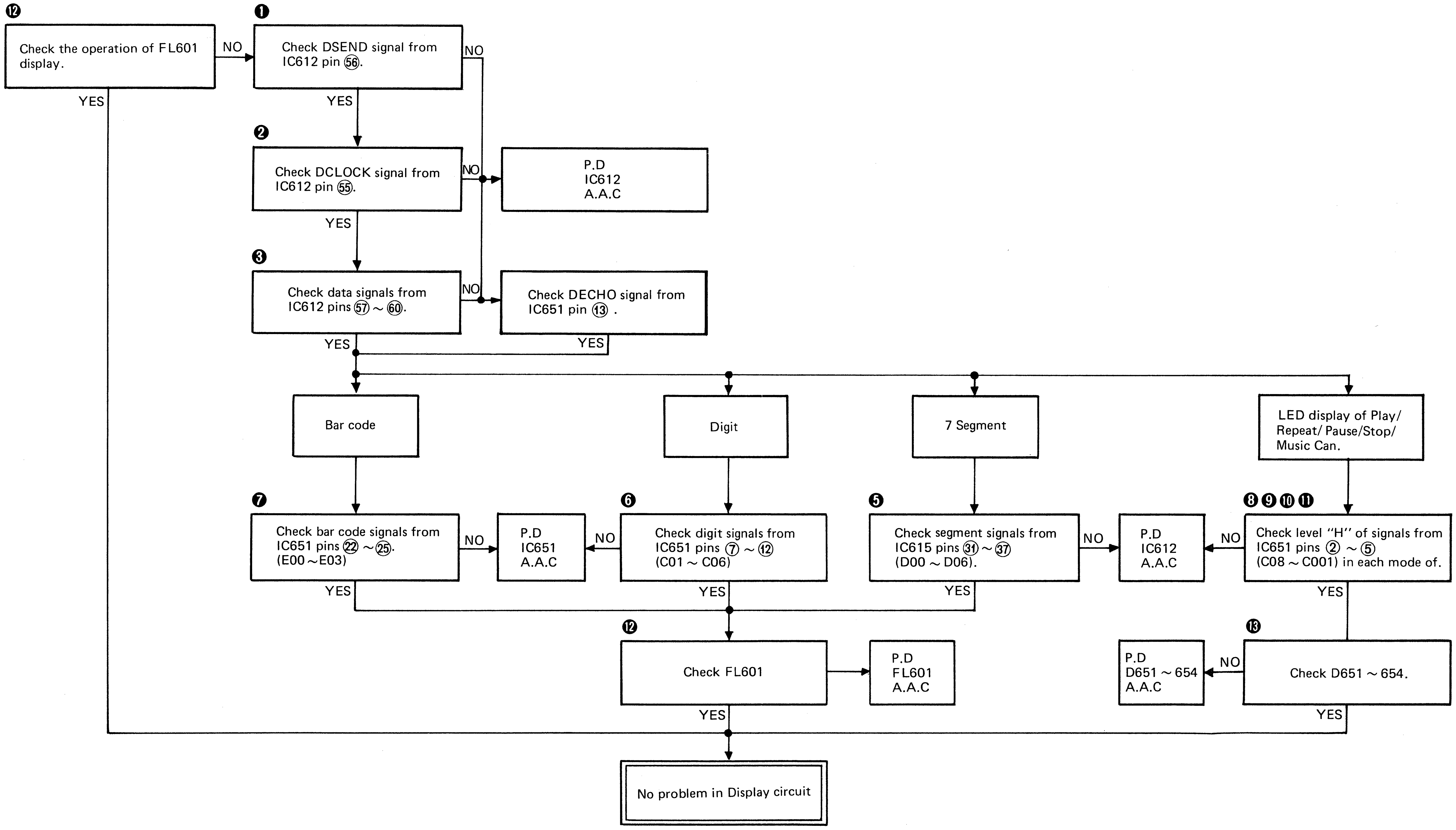
❼ • IC651 Pin ㉒ – ㉕ ....



10V/2msec. Div. AC

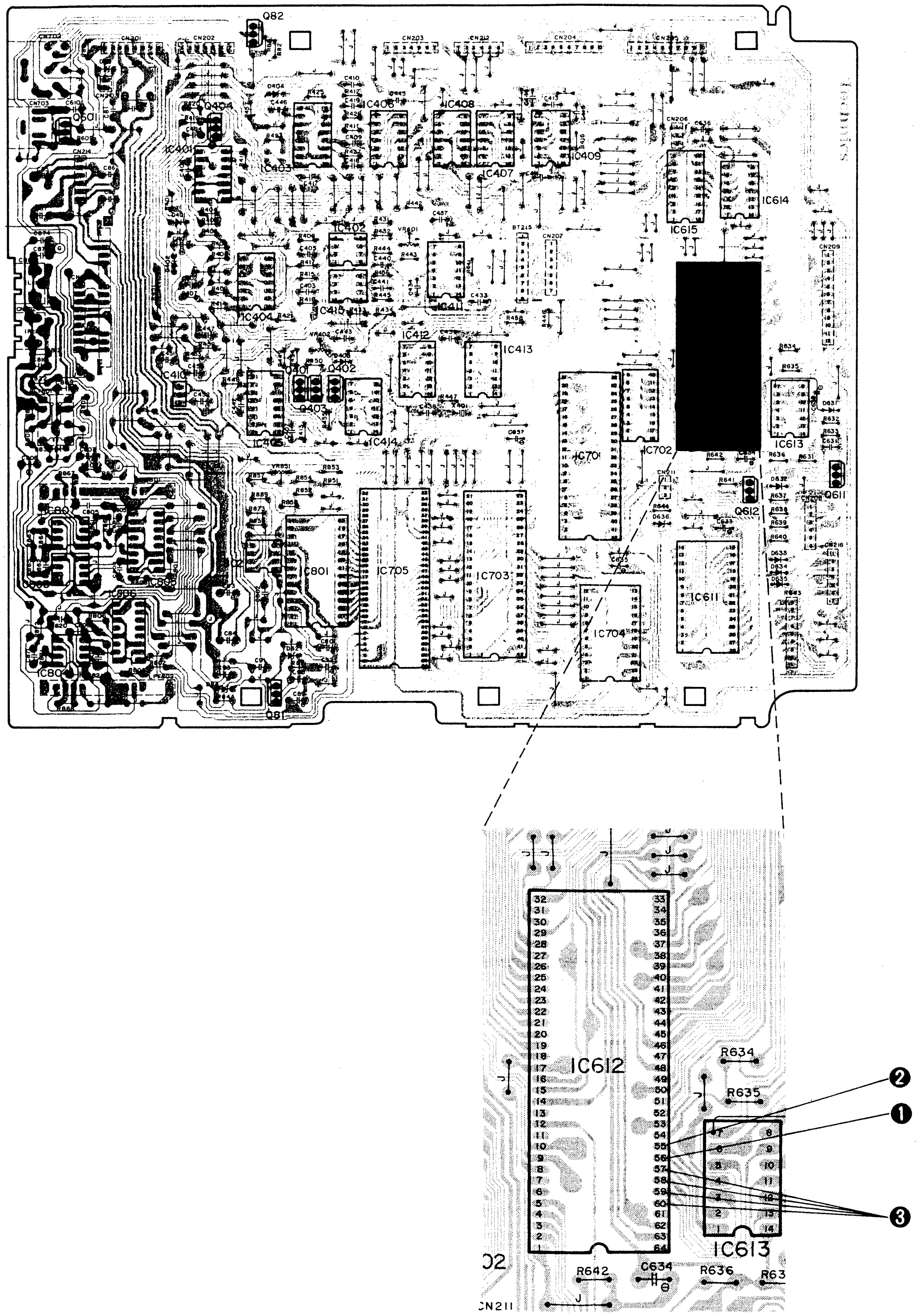
❽ • IC651 Pin ⑤ .... H (Play Mode)
❾ • IC651 Pin ④ .... H (Pause/stop Mode)
❿ • IC651 Pin ③ .... H (Repeat Mode)
⓫ • IC651 Pin ② .... H (Music Scan Mode)

If all the above-mentioned items are satisfied, there is no Problem in Display circuit.
If not, you must go to the following procedure.

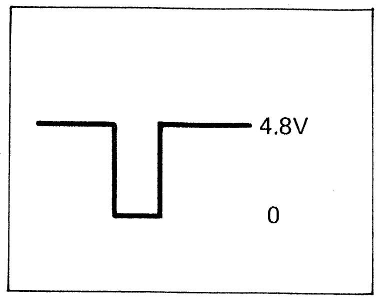

⓬
Check the operation of FL601 display.
NO
YES
❶
Check DSEND signal from IC612 pin (56).
NO
YES
❷
Check DCLOCK signal from IC612 pin (55).
NO
YES
P.D
IC612
A.A.C
❸
Check data signals from IC612 pins (57) ~ (60).
NO
YES
Check DECHO signal from IC651 pin ⑬ .
YES
Bar code
Digit
7 Segment
LED display of Play/ Repeat/ Pause/Stop/ Music Can.
❼
Check bar code signals from IC651 pins ㉒ ~㉕. (E00 ~ E03)
NO
YES
P.D
IC651
A.A.C
NO
❻
Check digit signals from IC651 pins ⑦ ~ ⑫ (C01 ~ C06)
YES
❺
Check segment signals from IC615 pins ㉛ ~ ㊲ (D00 ~ D06).
NO
YES
P.D
IC612
A.A.C
NO
❽❾❿⓫
Check level "H" of signals from IC651 pins ② ~ ⑤ (C08 ~ C001) in each mode of.
YES
⓬
Check FL601
YES
P.D
FL601
A.A.C
⓭
P.D
D651 ~ 654
A.A.C
NO
Check D651 ~ 654.
YES
No problem in Display circuit

If it is bassically not understandable, refer to item 4 in circuit Description.

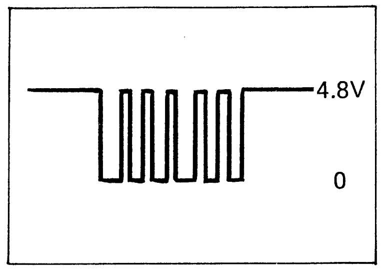
02 P.C.B.


Q82
CN202
CN203
CN204
IC401
IC403
IC404
IC405
IC406
IC407
IC408
IC409
IC410
IC411
IC412
IC413
IC414
IC415
IC501
IC801
IC802
IC614
IC615
IC613
IC611
Q611
Q612
IC702
IC701
IC703
IC704
IC705
Q81
IC612
IC613
R634
R635
R642
C634
R636
R63
CN211
02

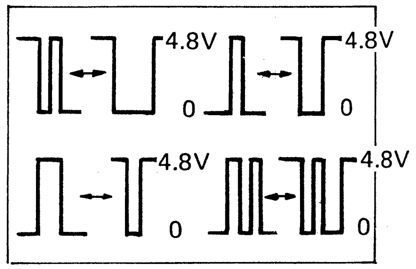
❶



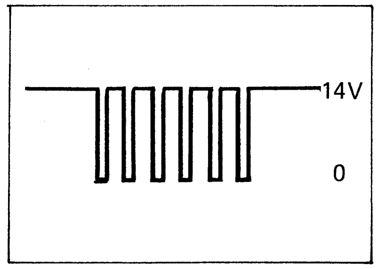
❷

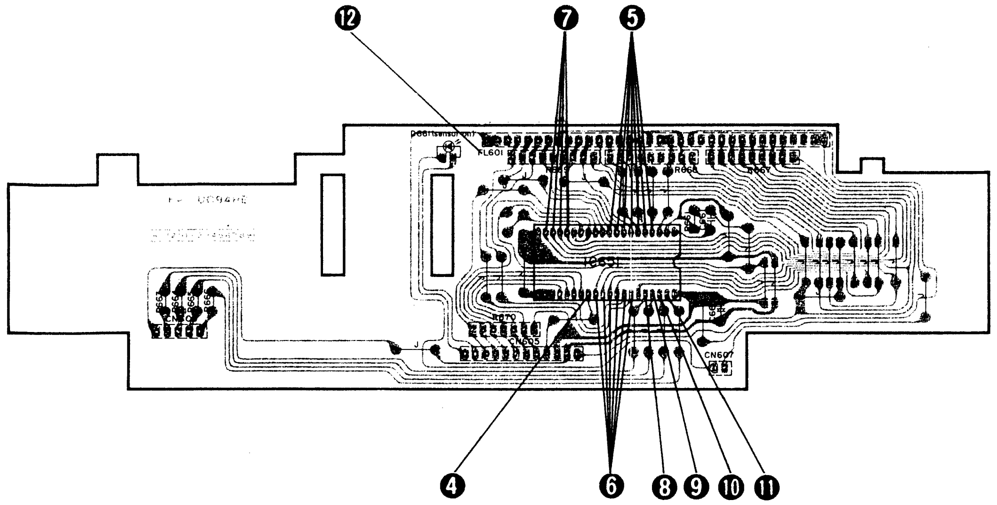


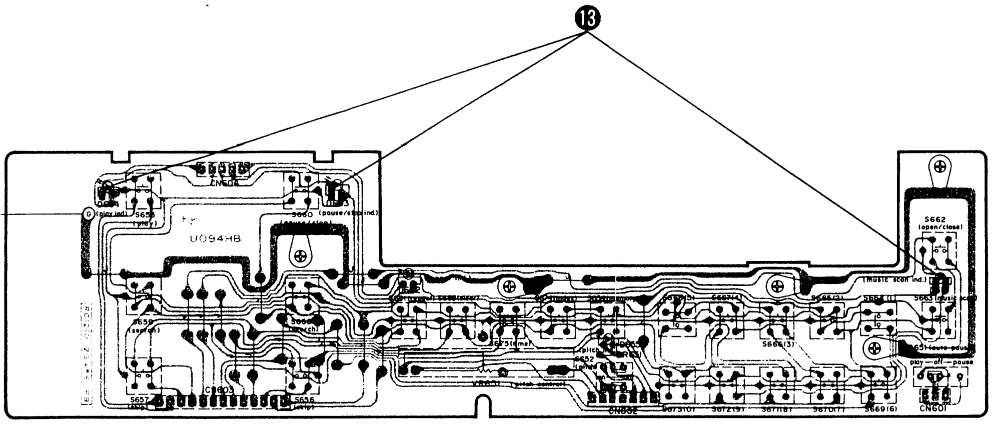
❸


4.8V
0
4.8V
0
4.8V
0
4.8V
0

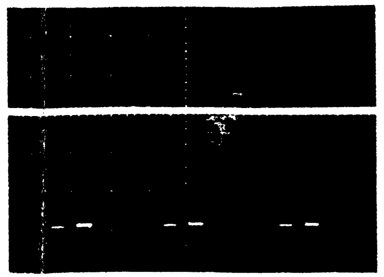
❹




⓬
❼
❺
IC651
CN601
❹
❻
❽
❾
❿
⓫

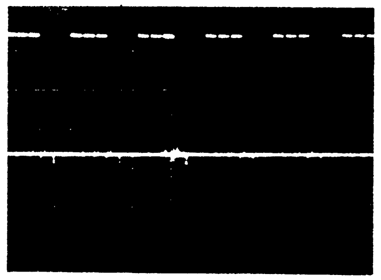

⓭
UO94HB
S662
CN602
CN601

❼



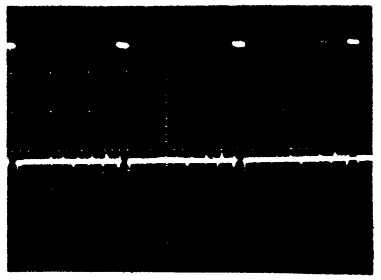
IC651 pin ㉒
10V/2msec Div. AC

❺



IC651 pin ㉛
10V/1msec Div.

❻



IC651 pin ⑦
10V/2msec. Div. AC

ORDER NO. DAD8402003 55

Service Manual

Supplement

VOL. 3

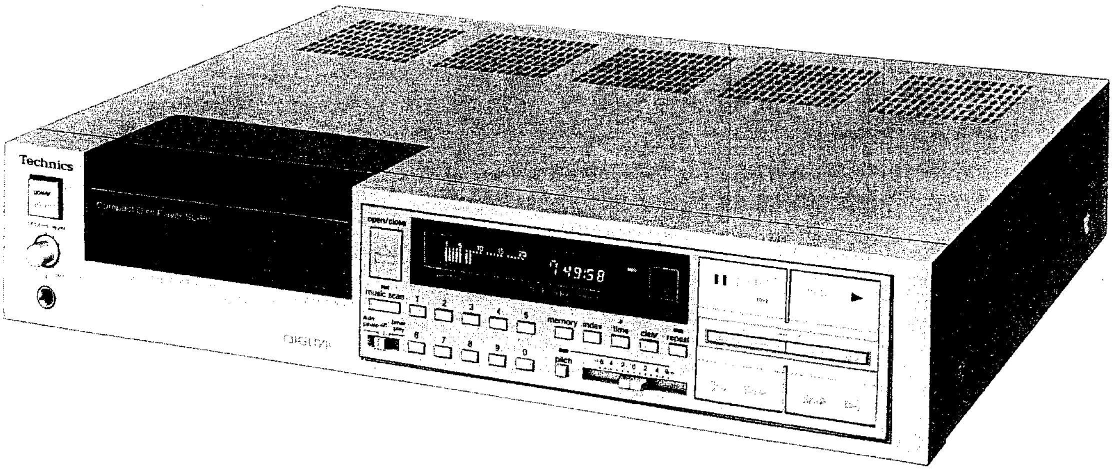
ADJUSTMENT MANUAL

Compact Disc Player

SL-P8

COMPACT disc DIGITAL AUDIO

DIGITAL



Technics

MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
DISC AUDIO DIVISION.

55

• Traverse Unit Servicing Method

(1) Remove the cabinet.

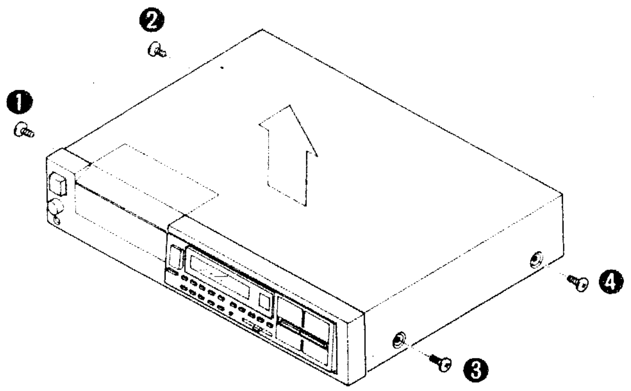


Fig. 1

- Remove screws ❶ ~ ❹ and lift the cabinet in the direction of the arrow.

(2) Remove the front panel, and separate the front panel from the FL. P.C.B.

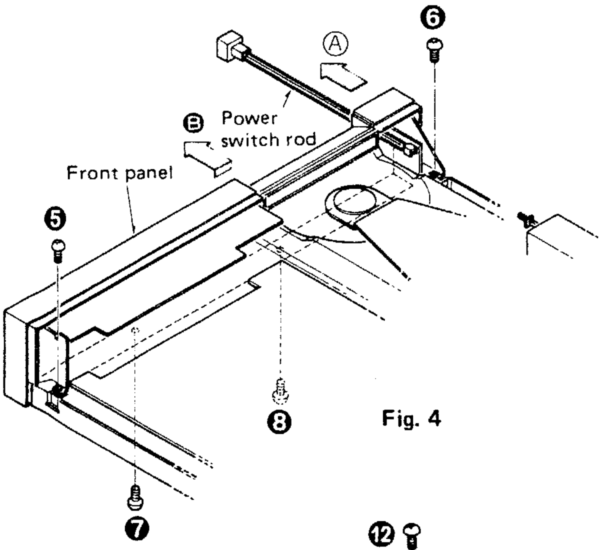
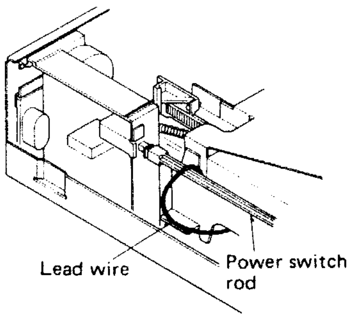

❻
Ⓐ
Ⓑ Power switch rod
Front panel
❺
❽
❼

Fig. 4

- Remove screws ❺ ~ ❽ , and power switch rod and front Panel in the direction of arrow Ⓐ with care not to scratch the disc holder.


Lead wire
Power switch rod

[Fig. 4-1]

Caution:
When installing the power switch rod, set it through the lead wire.

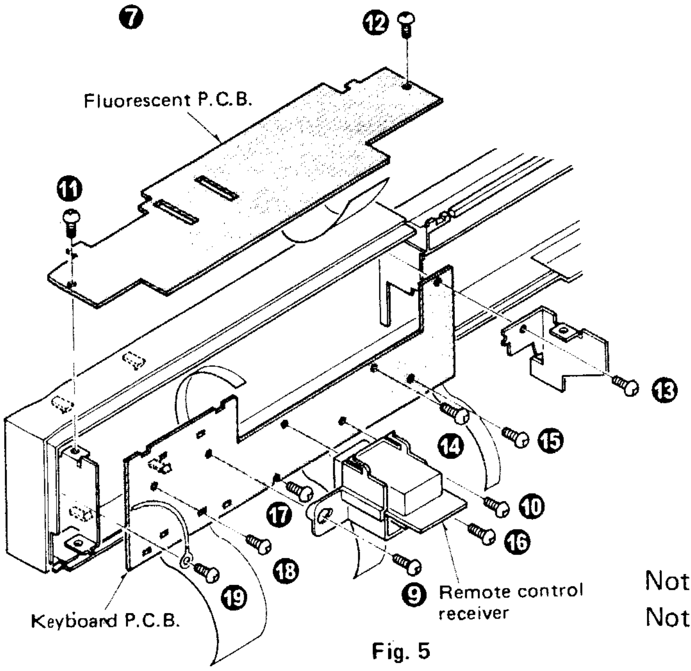

⓬
Fluorescent P.C.B.
⓫
⓭
⓮
⓯
❿
⓰
⓱
⓲
⓳
❾ Remote control receiver
Keyboard P.C.B.

Fig. 5

- Remove screws ❾ ~ ⓳ and release the P.C.B. fixing claws to separate the panel from FL P.C.B. and keyboard P.C.B.

Note 1: Keep the front panel separately.
Note 2: Make sure the lead wires between FL P.C.B. and digital P.C.B. are not disconnected.

Perform these adjustments by use of a traverse unit base in accordnace with the traverse unit servicing method to improve the workability.

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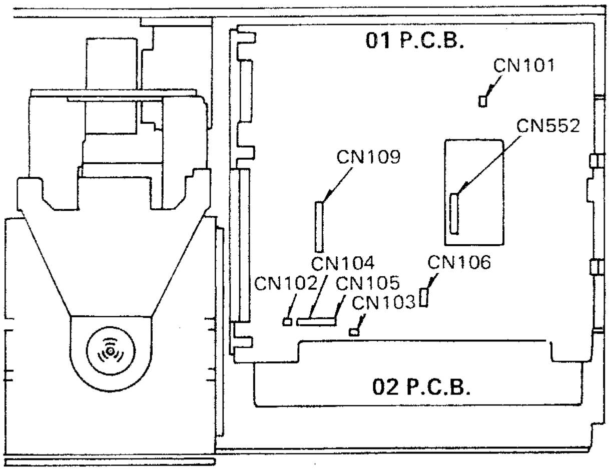
Page

1. Focus gain adjustment 6
2. Focus balance adjustment 7
3. Focus offset adjustment 7
4. Tracking gain adjustment 8
5. Tracking offset temporary adjustment 8
6. Tracking balance adjustment 9
7. Tracking offset adjustment 9
8. Offset adjustment in drop-out 10
9. Best eye adjustment 11
10. Traverse offset adjustment 11
11. PLL and CLV adjustment 12
12. Pitch Control adjustment 12
13. Amp. Gain adjustment 13
14. Tune Voltage adjustment 13
15. Audio distortion adjustment 14
16. Check of play operation after adjustment 14

Caution: In case the optical PU is individually replaced, it is necessary to perform mechanism adjustment before these adjustment.

(3) Pull out the connectors shown below.

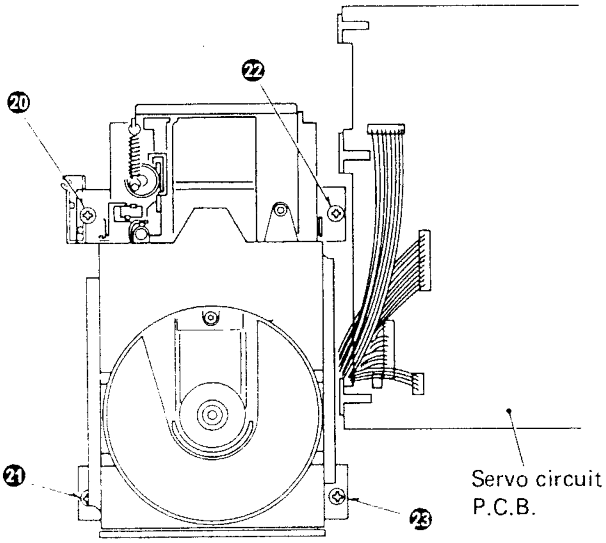

01 P.C.B.
CN101
CN552
CN109
CN104
CN106
CN102
CN105
CN103
02 P.C.B.

(a) CN101
CN105
CN106
CN109
CN552

(b) CN102
CN103
CN104

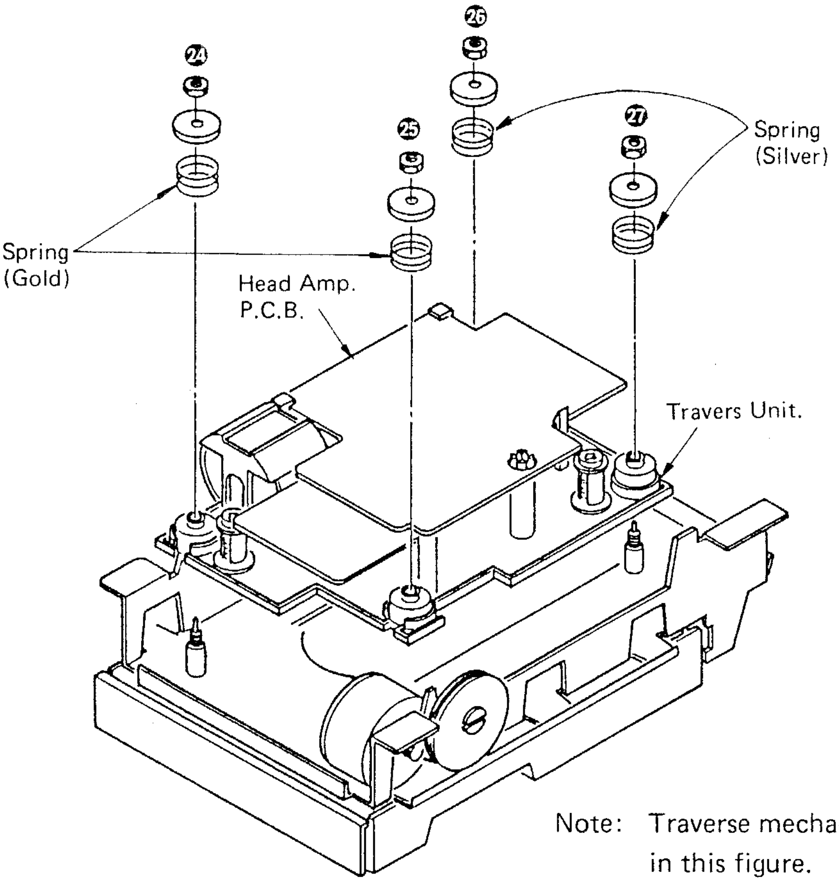
(4) Remove the traverse mechanism.

- Remove screws ⑳ ~ ㉓.
- Then the entire traverse mechanism can be removed from the set.


⑳
㉒
㉑
㉓
Servo circuit
P.C.B.

(5) Separate the tray from the traverse unit.

Separate the traverse mechanism [removed in step (4)] into tray and unit.



Note: Traverse mechanism is turned over in this figure.

- Remove nuts ㉔ ~ ㉗.
- After that, remove the holder and spring.

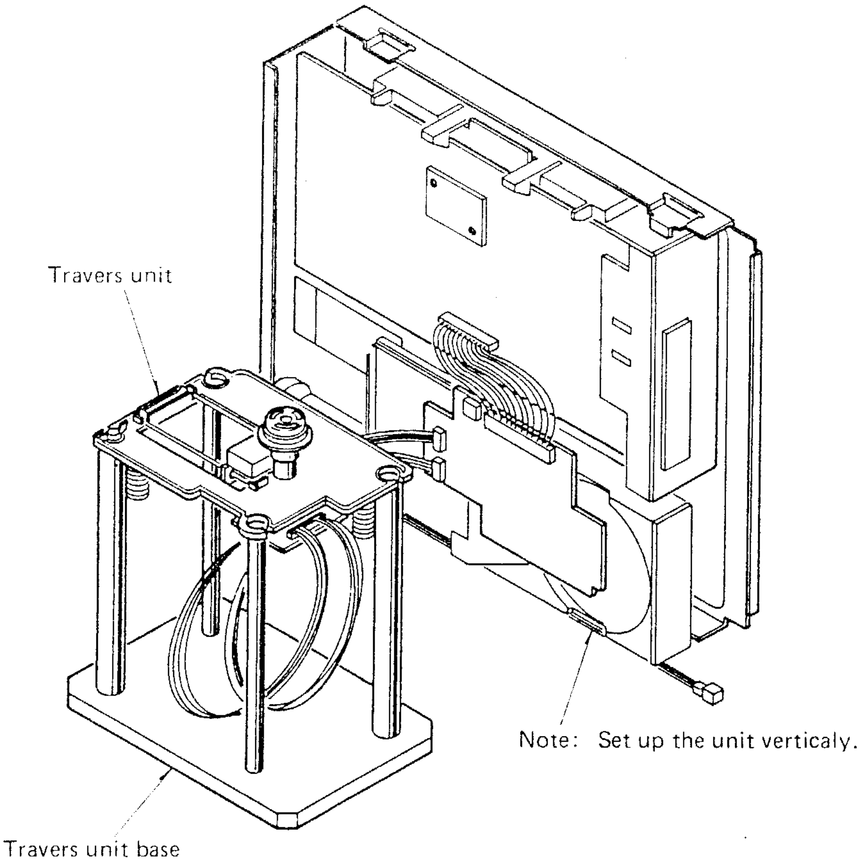
  Note: Take care not to confuse 2 types of springs (different in color Gold and Silver).
- With the above-mentioned procedure completed, the traverse mechanism is separated from tray and unit.

  Note: Cut off the lead wire clamper by use of nippers.

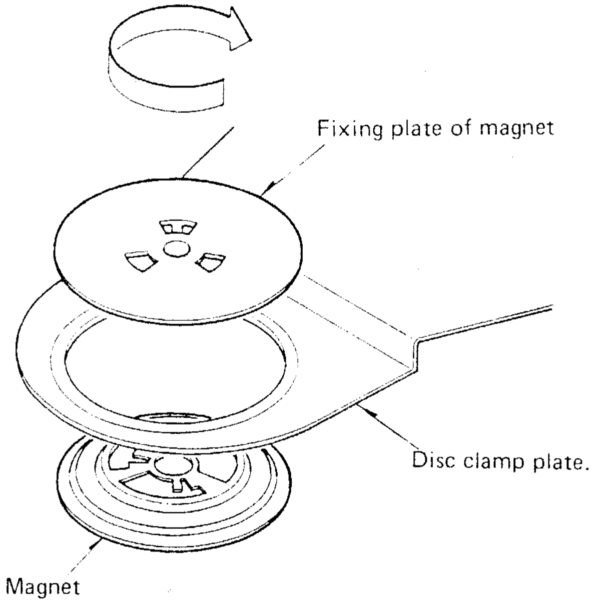
(6) Temporarily fasten the tray.

- Diagonally tighten the 2 screws removed in step (4).
- After that, connect only the connector (6) removed in step (3).

(7) Fix the traverse unit on traverse base.


Travers unit
Note: Set up the unit verticaly.
Travers unit base

- Remove the insulator rubber of traverse unit and fix the unit on the base (using thumb screw).
  - Keep the holder to EJECT position.
  - Hold the magnet with a hand and turn the fixing plate of magnet to clockwise.
    Note: If the fixing plate of magnet doesn't turn enough, please use a pliers to turn it.
  - Use the magnet for holding the disc.


Fixing plate of magnet
Disc clamp plate.
Magnet

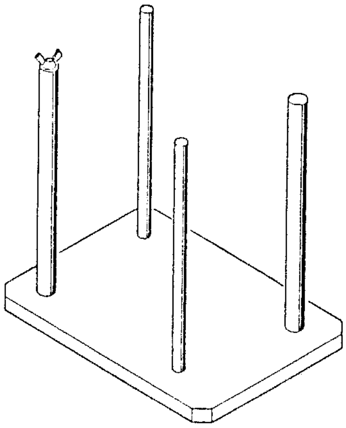
• Testers and Jigs for Adjustments

Testers

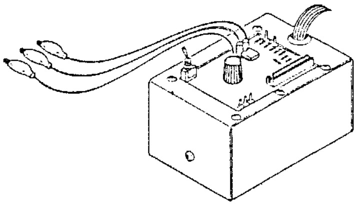
1) Two-channel oscilloscope (with trigger) of 30 MHz or over.
2) Low frequency oscillator.
3) Digital voltmeter.
4) Distortion meter.

Jigs

1) Traverse unit base (SZZP1016F)



2) Servo gain adjuster (SZZP1017F)



3) Short leads with clip (2 pcs.)

4) Test disc
Part No. SZZP1014F

5) Ordinary disc

1. Focus gain adjustment

1) Connect the gain adjusting jig to the set.

(Red) .... Jumper above IC651 on 08 P.C.B. (+15V)
(Blue) .... Jumper beside IC651 on 08 P.C.B. (−15V)
(Green) .... Chassis

Refer to the drawing given at the end of the manual. (Page 15.)

Connector .... Pull out CN109 on 01 P.C.B. and connect it to the connector of the jig. And connect the connector from jig to CN109.

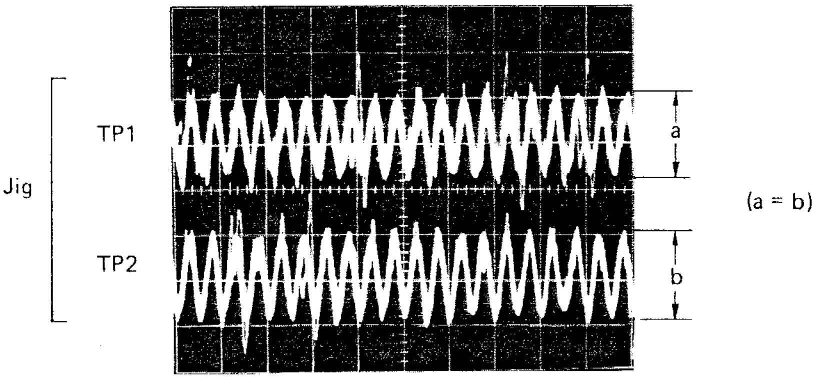
2) Adjust the low frequency oscillator to **750Hz** frequency and 150mVp-p output voltage, and connect it to TEST pin OSC IN and GND of the jig.

3) Connect CH1 and CH2 of oscilloscope to TP1 and TP2 of the Jig. (TP3 is GND.)
Oscilloscope setting:

VOLT .... 100 mV (both channels)
SWEEP .... 2 ms
Input .... AC

4) Set the power SW "on" of jig and the rotary switch of jig to "1" and place the disc.

5) Turn power switch ON. When turntable begins to rotate, **750Hz** signal appears on the oscilloscope. Then adjust VR102 so that the waveforms of both channels are equal to each other.



2. Focus balance adjustment

1) Set the power SW "on" of jig and the rotary switch of jig to "2" and disconnect the input from the oscillator.

2) Ground the pin 23 of IC101 (AN7677) on 03 P.C.B. (Head Amp.)

   Note: Using a lead with clip to catch C112 (near the leg of C115) makes the job easier.

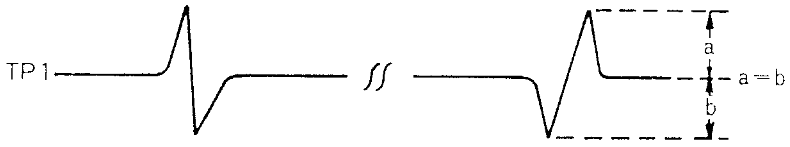
3) Pull out connector CN 108 on 01 P.C.B.

4) Connect the oscilloscope to TP1 on 03 P.C.B. and place the disc.

   Note: TP1 is located between VR102 and VR103.

   Oscilloscope setting:
   VOLT . . . . .200 mV
   SWEEP . . . . 5 ms
   Input . . . . AC

5) Turn power switch ON. When the laser lights up, S-shaped waveform appears on the oscilloscope. Then adjust VR103 so that the top and bottom peak values are equal to each other.



Note: The above-mentioned S-shaped waveform will disappear in 5 or 6 sec. So, ground the pin ① of CN109 while LD is lighted, and the waveform will last for about 20 seconds.

3. Focus offset adjustment

1) Keep the power SW "on" of fig and the rotary switch of jig at "2".
2) Put in connector CN108 to correct position.
3) Shift the set to EJECT mode.
4) Connect a variable voltmeter to TP1 on 03 P.C.B.
5) Turn power switch ON, and adjust VR107 so that DC voltage of the voltmeter is 0 ± 10 mV.

4. Tracking gain adjustment

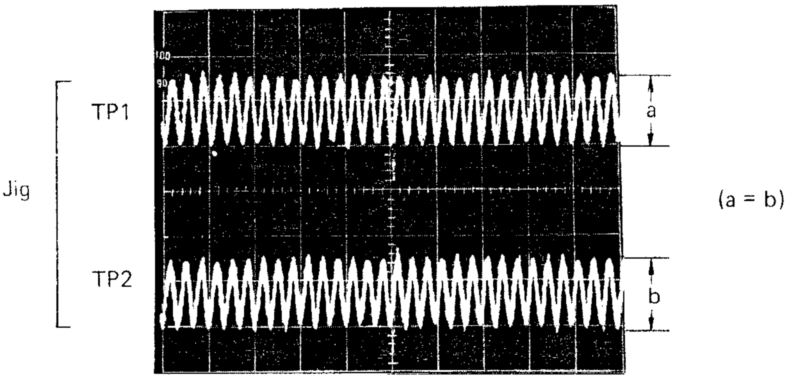
1) Set the power SW "on" of jig and the rotary switch of the jig to "3".

2) Adjust the low frequency oscillator to 1.5 kHz and 150 mVp-p output. And connect it to TEST pin OSC IN and GND of the jig.

3) Connect CH1 and CH2 of oscilloscope to TEST pin TP1 and TP2 of the jig. (TP3 is GND.)

Oscilloscope setting:
VOLT . . . . .100 mV (both channels)
SWEEP 0.5ms
Input . . . . AC

4) Turn power switch ON. When turntable begins to rotate, 1.5 kHz signal appears on the oscilloscope, Then adjust VR105 so that the waveform amplitudes of both channels, are equal to each other.



5. Tracking offset temporary adjustment

1) Set the power SW "on" of jig and the rotary switch of jig to "2", and disconnect the input from oscillator.

2) Shift the set to EJECT mode.

3) Connect a variable voltmeter to TP2 on 03 P.C.B.

Note: TP2 is located between VR107 and VR105.

4) Turn power switch ON, and adjust VR106 so that DC voltage of the voltmeter is 0 ±3mV.

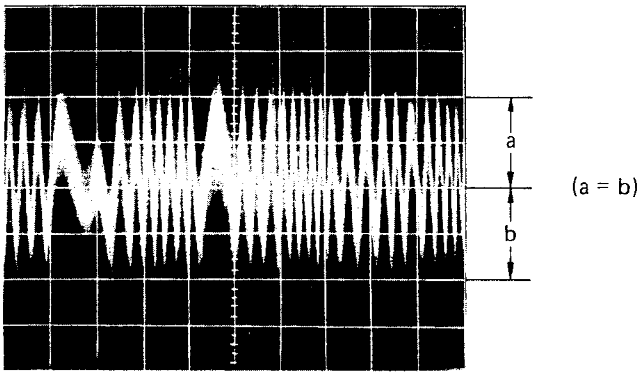
6. Tracking balance adjustment

1) Keep the power SW "on" of jig and the rotary switch of jig at "2".

2) Connect the oscilloscope to TP2 on 03 P.C.B. and then place the disc.

   Oscilloscope setting:
   VOLT . . . . 50 mV
   SWEEP . . . . 5 ms
   Input . . . . DC

3) Turn power switch ON. When turntable begins to rotate and the tracking servo switch of jig is turned OFF, TE (tracking error) signal appears on the oscilloscope.
   Then adjust VR104 so that the top and bottom peak values are equal to each other.



7. Tracking offset adjustment

1) Keep the power SW "on" of jig and the rotary switch of jig at "2".

2) Shift the set to EJECT mode.

3) Connect a variable voltmeter to TP2 on 03 P.C.B.

4) Turn power switch ON, and adjust VR106 so that the DC voltage of voltmeter is 0 ± 3 mV.

   Note: After the above-mentioned adjustment, remove the gain adjusting jig and connect CN109 to restore the original state of the unit.

8. Offset adjustment in drop-out

1) Connect the oscilloscope to the points mentioned below.

CH1 . . . . .TP1 (03 P.C.B.)
CH2 . . . . .TP2 (03 P.C.B.)
EXT . . . . .Q305 collector on 01 (A) P.C.B.

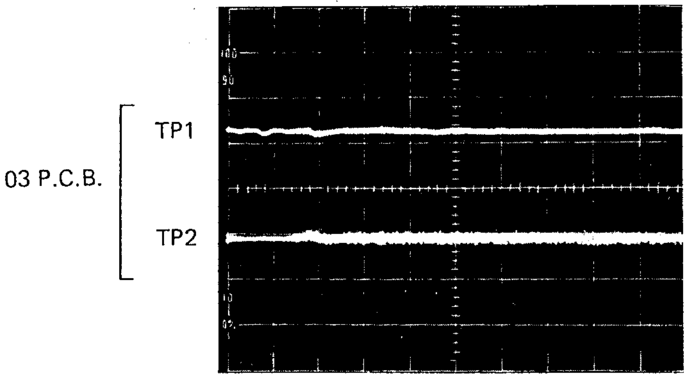
Oscilloscope setting.

VOLT . . . . 0.5V (both channel)
SWEEP . . . . 0.5 ms
Input . . . . AC
Trigger . . . . EXT. NORM

2) Play the band 13 (0.5 mm black spot) of the test disc.

3) Watching the waveform of CH1 of the oscilloscope, adjust VR107 so that the waveform amplitude near the trigger point is minimized.
If not minimized, adjust so that the waveform top and bottom are nearly symmetrical.

4) Watching the waveform of CH2 of the oscilloscope, adjust VR106 so that the waveform amplitude near the trigger point is minimized. If not minimized adjust so that the waveform top and bottom are nearly symmetrical.



Minimized amplitude by VR107

Minimized amplitude by VR106

EXT ⎍

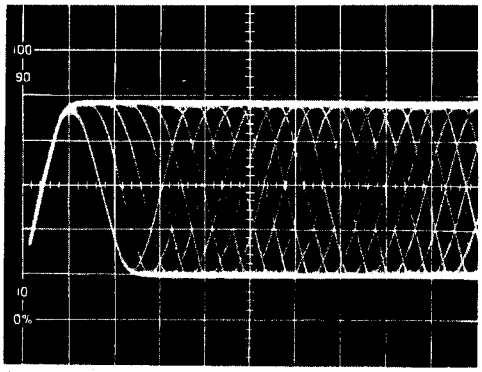
9. Best eye adjustment

1) Monitor RF signal on oscilloscope.

2) Connect CH1 of oscilloscope to the points CN109 pin ❸ (OLD P.C.B.) or RF pin (NEW P.C.B.) on 01 P.C.B.

Oscilloscope setting:
Volt .... 500 mV
SWEEP .... 0.5 μs
Input .... AC

3) Adjust VR103 so that the eye pattern of RF signal is widest open.



10. Traverse offset adjustment

1) Connect the DC voltmeter to the points Q205 emitter (OLD P.C.B.) or TVS pin (NEW P.C.B.) on 01 P.C.B.

2) Shift the set to EJECT mode.

3) Turn power supply ON, and adjust VR201 so that DC voltage of the voltmeter is 0±10 mV.

11. PLL and CLV Adjustment

1) Shift the set to play mode. (An ordinary disc can be used. Play it near the channel part.)

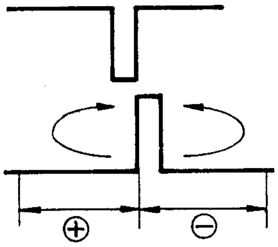
2) Connect CH1 and CH2 of the oscilloscope to test pins TP512 (FCLK) and TP513 (CLDCK) on 01 P.C.B.

Oscilloscope setting

Volt .... 2V (both channels)
Sweep .... 20 μs
Input select .... AC
Trigger .... CH1 + CH2 (NORM) ⊕
Mode .... ALT

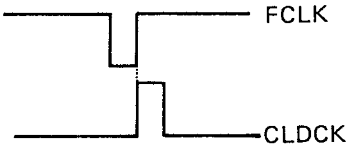
3) Ground the both test pins MWB and TP514 (RESY) on 01 P.C.B.

4) The same operation as shown below is obtained when VR402 on 02 P.C.B. is moved. So, make the fine adjustment of VR401 on 02 P.C.B. so that the conditions shown below are satisfied.



Control the values of ⊕ and ⊖ outside the lock range (more than 8 μs both ⊕ and ⊖)

5) Adjust VR402 so that the conditions in the photo are satisfied.



12. Pitch Control Adjustment

1) Shift the slide VR of front panel to the center and turn ON the pitch switch.

2) Connect the frequency counter to TP512 (FCLK).

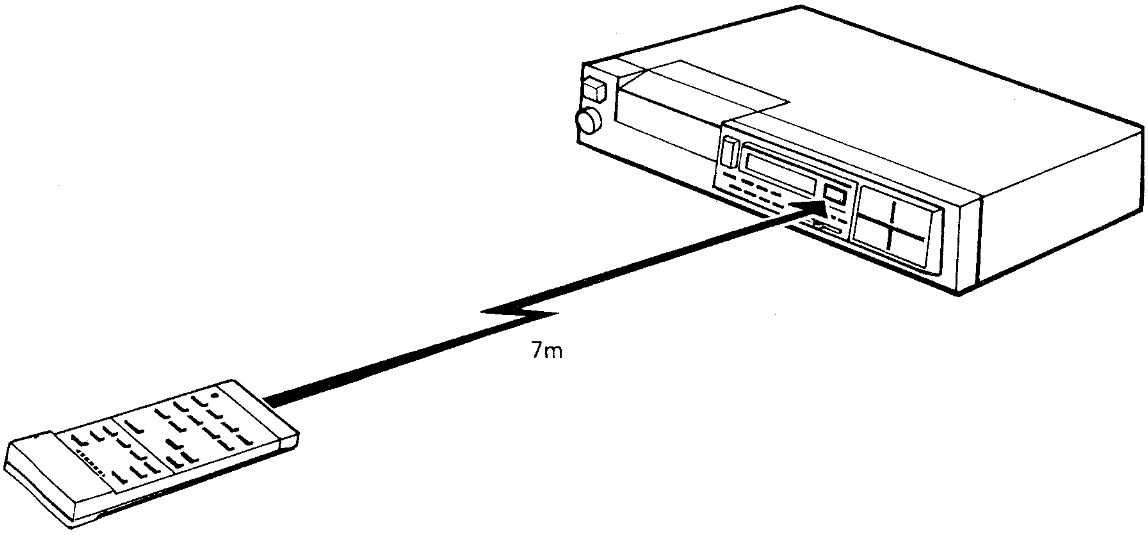
3) Adjust VR403 (02 P.C.B.) so that the frequency counter indicates 7.35 ±0.03kHz.

Note: If frequency counter is not available, adjust VR403 so that the frequencies of TP512 nearly agree when pitch switch is turned ON/OFF.

13. Amp. Gain Adjustment

(Visual check)

1) Push the power switch "ON" of the set.
2) When push any key of the transmitter,and confirm a sensor LED on the front panel of the set to light. and then keep a distance about 7m between transmitter and receiver in a straight line.
3) And confirm a sensor LED whether it lights or is doesnt. If it doesnt light adjust R1103,so that the sensor LED will be lighted.



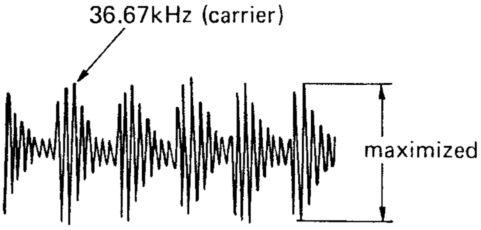
14. Tune Voltage Adjustment

1) Push the power switch "ON" of the set.

2) Connect the oscilloscope to the anode of D1102.

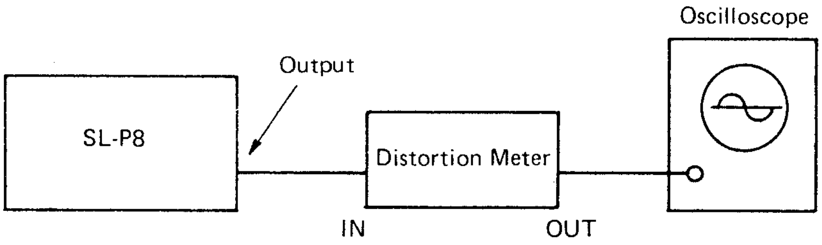
3) Press any button of the transmitter about 7m distance between each other. (Receiving the signal from the transmitter).

4) Adjust the T1101 so that the waveform of oscilloscope is maximzed as below.



15. Audio distortion adjustment

1) Connect the output terminal of the set to a distortion meter, and monitor the output of the distortion meter by oscilloscope.
   (1) Set
   (2) Output terminal
   (3) Distortion meter
   (4) Oscilloscope



2) Play the band 3 (1 kHz, 0 dB) of test disc.

3) After adjusting the filter of distortion meter to 1 kHz, adjust VR851 on 02 P.C.B. so that the distortion is minimized.

16. Check of play operation after adjustment

Check of skip search

1) Play an ordinary disc.
2) Press the skip button and check to see that skip search is given. (Forward and reverse)

Check of manual search

1) Play an ordinary disc.
2) Press the manual search button and check to see that smooth manual search can be done at low and high speeds. (Forward and reverse)

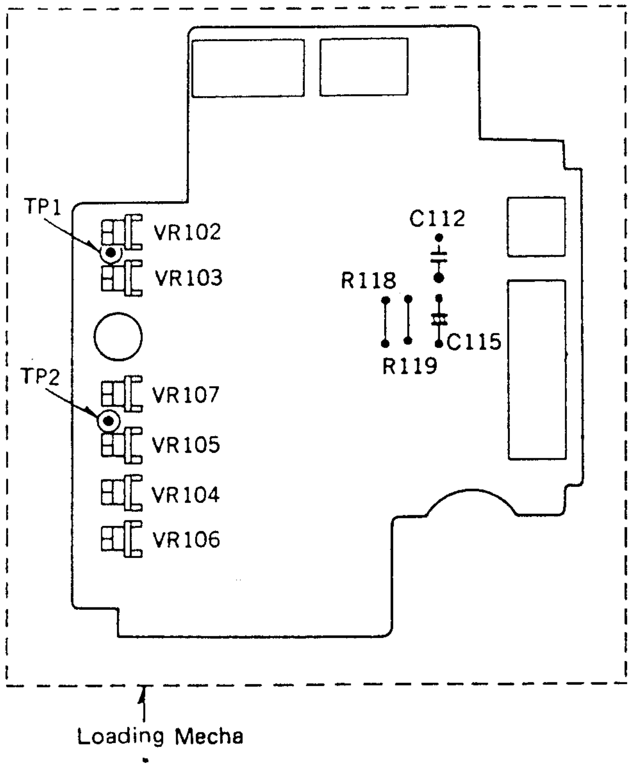
Check for defects

1) Play the band 12 of test disc, and check to see that there is no sound skip or noise. (Black spot)
2) Play the band 14 of test disc, and check to see that there is no sound skip or noise. (Finger print)

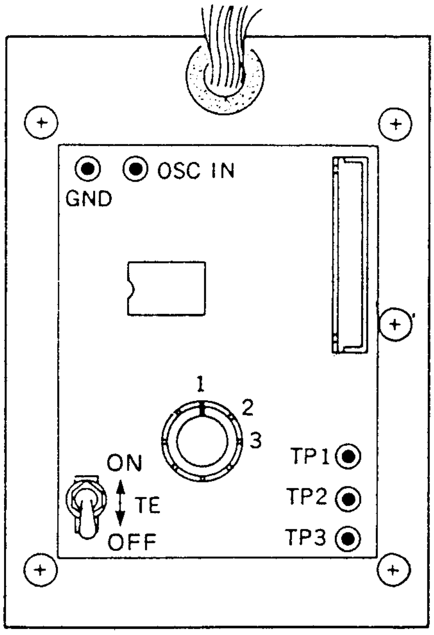
– MEMO –

Test point

- 03 P.C.B. Under traverse.

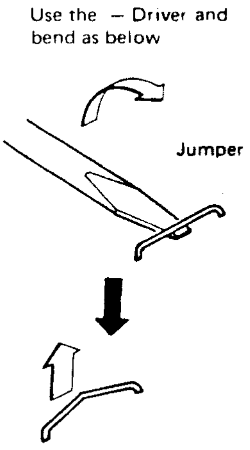

TP1
VR102
VR103
TP2
VR107
VR105
VR104
VR106
C112
R118
R119
C115
Loading Mecha

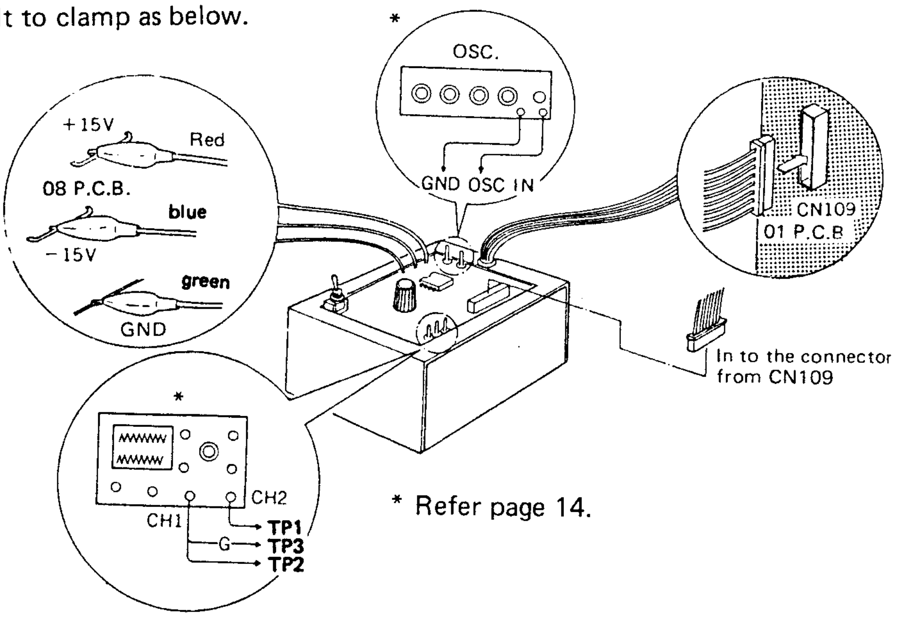
- Servo Gain Adjuster


GND
OSC IN
1
2
3
ON
TE
OFF
TP1
TP2
TP3

- **Servo Gain Adjuster and its Connection**

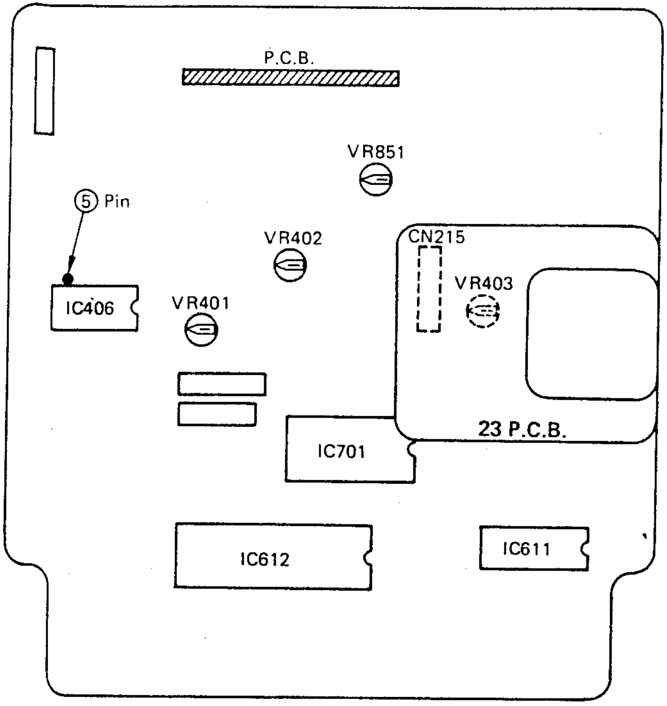
If jumper wire is difficult to clamp as below.


Use the – Driver and bend as below
Jumper

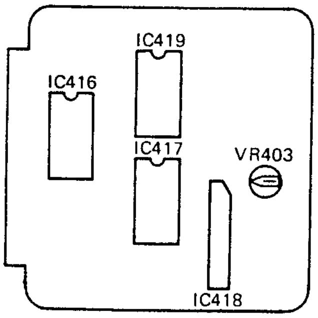

*
OSC.
GND OSC IN
+15V
Red
08 P.C.B.
blue
−15V
green
GND
CN109
01 P.C.B
In to the connector from CN109
*
CH2
CH1
G
TP1
TP3
TP2

* Refer page 14.

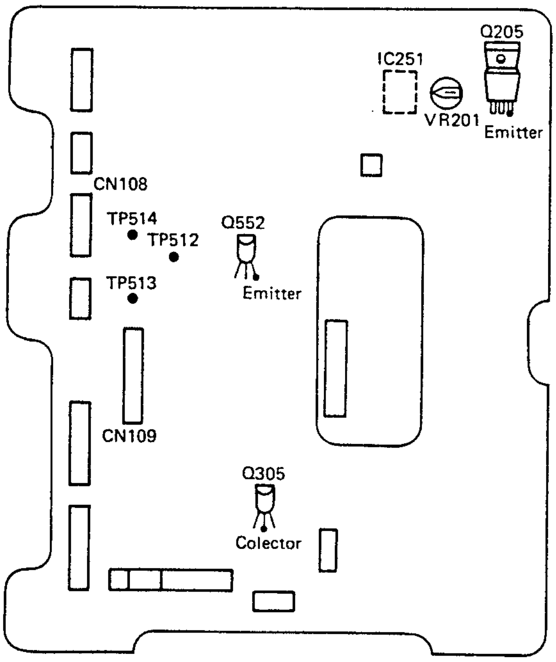
• 02 P.C.B.


P.C.B.
VR851
⑤ Pin
VR402
CN215
VR403
IC406
VR401
23 P.C.B.
IC701
IC612
IC611

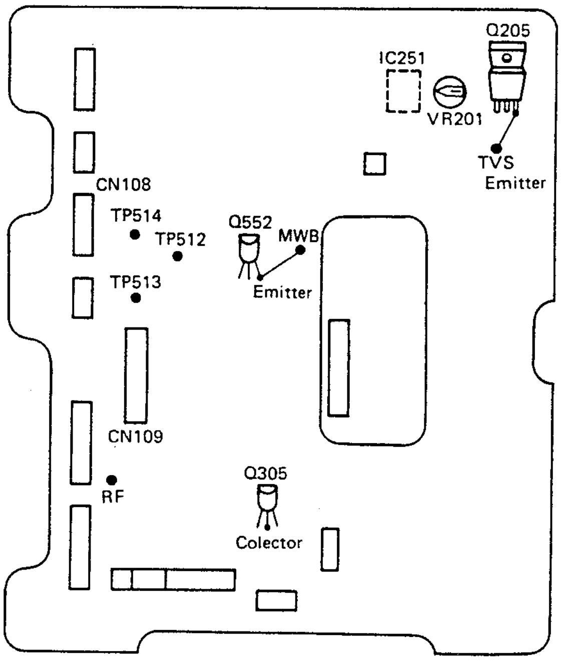
• 23 P.C.B.


IC419
IC416
IC417
VR403
IC418

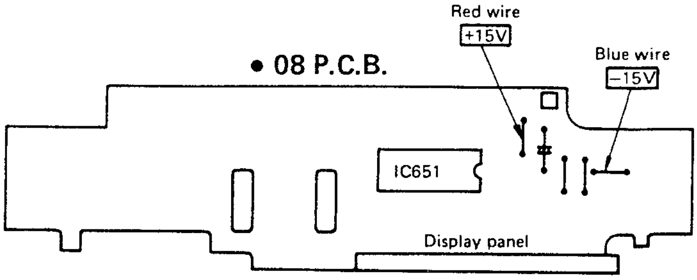
• 01 P.C.B. (OLD)


Q205
IC251
VR201
Emitter
CN108
TP514
TP512
Q552
TP513
Emitter
CN109
Q305
Colector

• 01 P.C.B. (NEW)


Q205
IC251
VR201
TVS
Emitter
CN108
TP514
TP512
Q552
MWB
TP513
Emitter
CN109
RF
Q305
Colector

• 08 P.C.B.


Red wire
+15V
Blue wire
−15V
IC651
Display panel

ORDER NO. DAD8405V4

A6

Service Manual

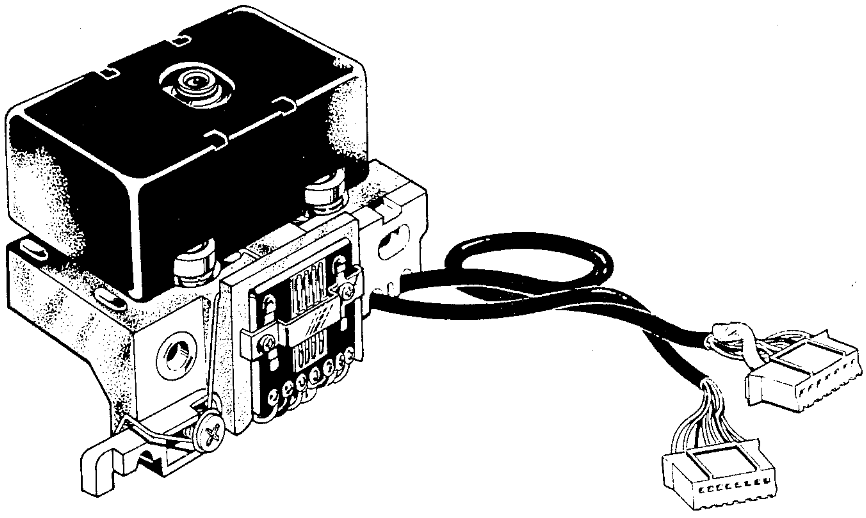
VOL.4

ADJUSTMENT MANUAL

for optical pick-up

Compact Disc Player

SL-P7/P75/P78/P8



Optical pick-up Parts No. SRLP007N01A

Technics

MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
DISC AUDIO DIVISION.

A optical pick-up is supplied individually. This adjustment manual is mentioned about how to find a pick-up defect and its adjustment procedure when it is occured to change the optical pick-up itself.

CONTENTS

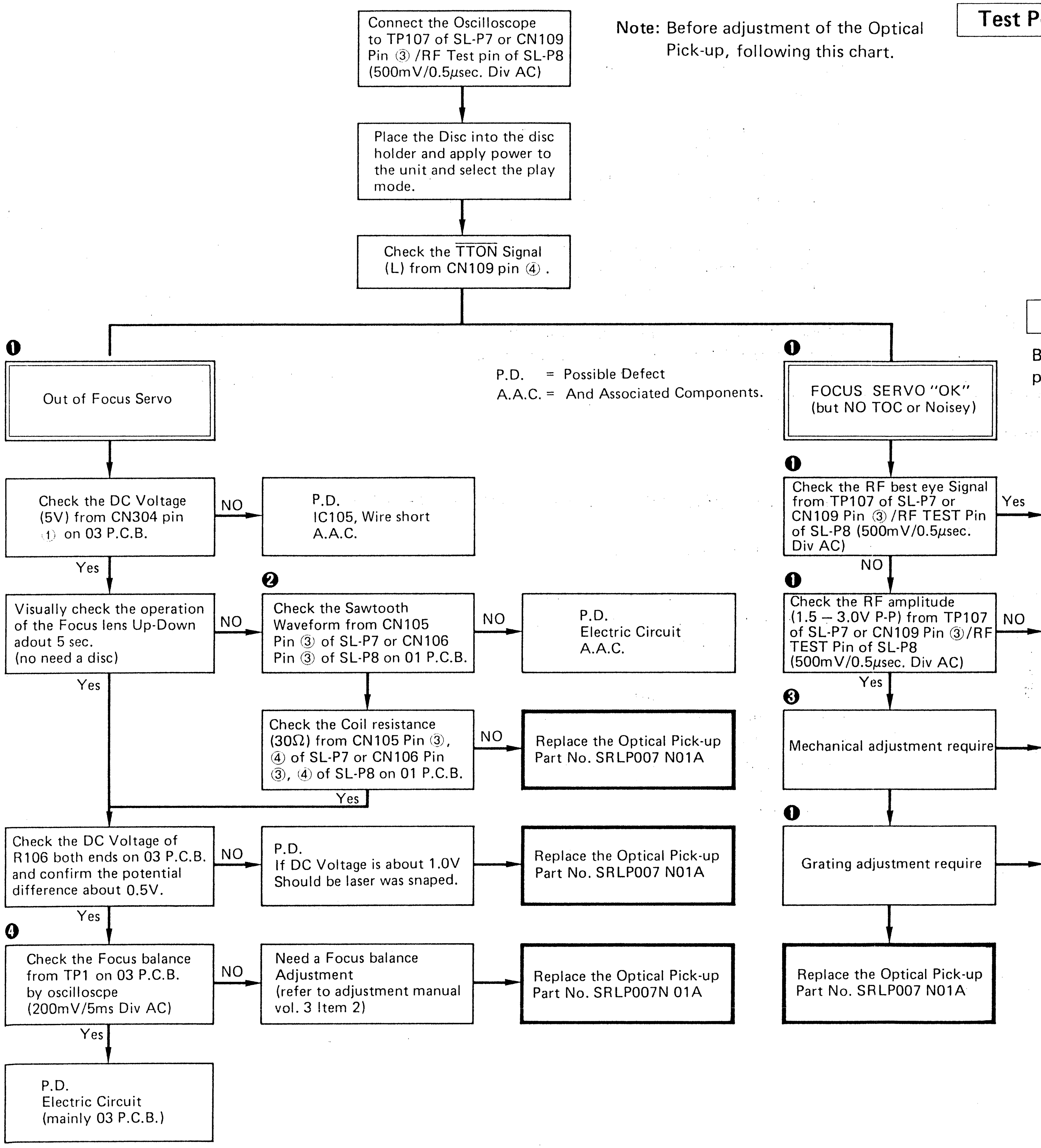
Page

1. Approval judgement of defect for optical pick-up (SRLP007N01A) (Trouble shooting).. 1
2. How to replace the optical pick-up of the traverse deck 3
3. Testers and gauge kits for adjustment 4
4. How to aligh the optical pick-up of the traverse deck 5
   A. Rest position adjustment
   B. Turntable height adjustment
   C. Mechanical adjustment
   D. Grating adjustment
5. Electrical alignment of main unit (vol. 3) 9
6. Others 9

VOL 4

1. Approval judgement of defect for optical pick-up (SRLP007N01A)

Note: Before adjustment of the Optical Pick-up, following this chart.


Connect the Oscilloscope to TP107 of SL-P7 or CN109 Pin ③ /RF Test pin of SL-P8 (500mV/0.5μsec. Div AC)

Place the Disc into the disc holder and apply power to the unit and select the play mode.

Check the $\overline{\text{TTON}}$ Signal (L) from CN109 pin ④ .

P.D. = Possible Defect
A.A.C. = And Associated Components.

❶ Out of Focus Servo

Check the DC Voltage (5V) from CN304 pin ① on 03 P.C.B. — NO → P.D. IC105, Wire short A.A.C.

Yes ↓

Visually check the operation of the Focus lens Up-Down adout 5 sec. (no need a disc) — NO → ❷ Check the Sawtooth Waveform from CN105 Pin ③ of SL-P7 or CN106 Pin ③ of SL-P8 on 01 P.C.B. — NO → P.D. Electric Circuit A.A.C.

↓ Check the Coil resistance (30Ω) from CN105 Pin ③, ④ of SL-P7 or CN106 Pin ③, ④ of SL-P8 on 01 P.C.B. — NO → **Replace the Optical Pick-up Part No. SRLP007 N01A**

Yes ↓

Check the DC Voltage of R106 both ends on 03 P.C.B. and confirm the potential difference about 0.5V. — NO → P.D. If DC Voltage is about 1.0V Should be laser was snaped. → **Replace the Optical Pick-up Part No. SRLP007 N01A**

Yes ↓

❹ Check the Focus balance from TP1 on 03 P.C.B. by oscilloscpe (200mV/5ms Div AC) — NO → Need a Focus balance Adjustment (refer to adjustment manual vol. 3 Item 2) → **Replace the Optical Pick-up Part No. SRLP007N 01A**

Yes ↓

P.D. Electric Circuit (mainly 03 P.C.B.)

❶ FOCUS SERVO "OK" (but NO TOC or Noisey)

❶ Check the RF best eye Signal from TP107 of SL-P7 or CN109 Pin ③ /RF TEST Pin of SL-P8 (500mV/0.5μsec. Div AC) — Yes → P.D. Electric Circuit (Specialy Pick-out or PLL circuits)

NO ↓

❶ Check the RF amplitude (1.5 – 3.0V P-P) from TP107 of SL-P7 or CN109 Pin ③/RF TEST Pin of SL-P8 (500mV/0.5μsec. Div AC) — NO → IF lest than 1.5V P-P should be leser diode become Worst → **Replace the Optical Pick-up Part No. SRLP007 N01A**

Yes ↓

❸ Mechanical adjustment require → Refer to the next steps Page 9. (Grating adjustment) and confirm the N mark Waveform as shown in figure ③.

↓

❶ Grating adjustment require → Refer to the next steps page 8. (Mechanical adjustment) and confirm the RF best eye Signal as shown in figure ①.

↓

Replace the Optical Pick-up Part No. SRLP007 N01A

Test Points

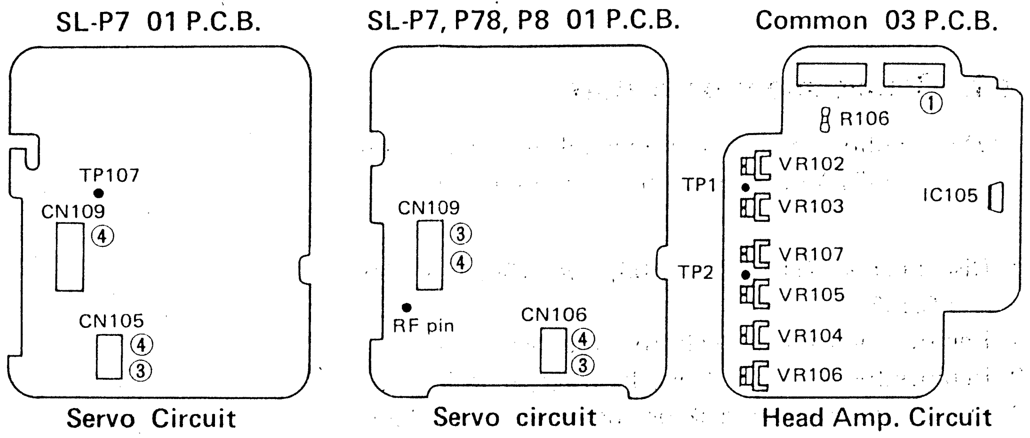

SL-P7 01 P.C.B.
TP107
CN109
④
CN105
④
③
Servo Circuit
SL-P7, P78, P8 01 P.C.B.
CN109
③
④
RF pin
CN106
④
③
Servo circuit
Common 03 P.C.B.
R106
①
VR102
VR103
IC105
TP1
TP2
VR107
VR105
VR104
VR106
Head Amp. Circuit

Fig: 1-1. Connection view of the each P.C.B.

Pre adjustment

Before judgement of optical pick-up, confirme the position of each volume as shown in figure 1-2.

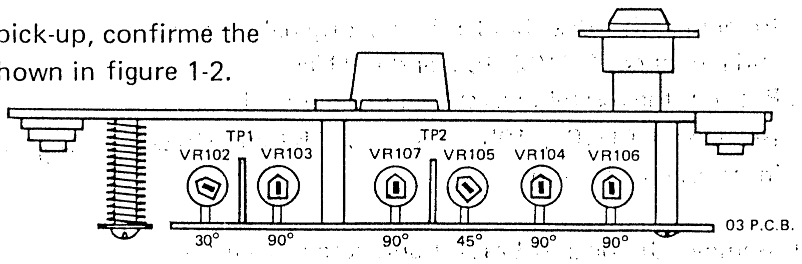
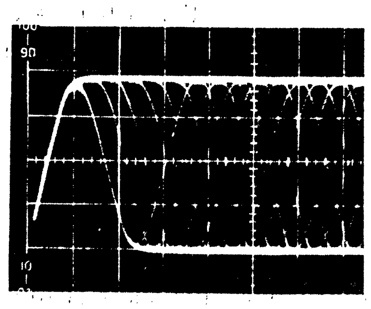

TP1
TP2
VR102
VR103
VR107
VR105
VR104
VR106
30°
90°
90°
45°
90°
90°
03 P.C.B.

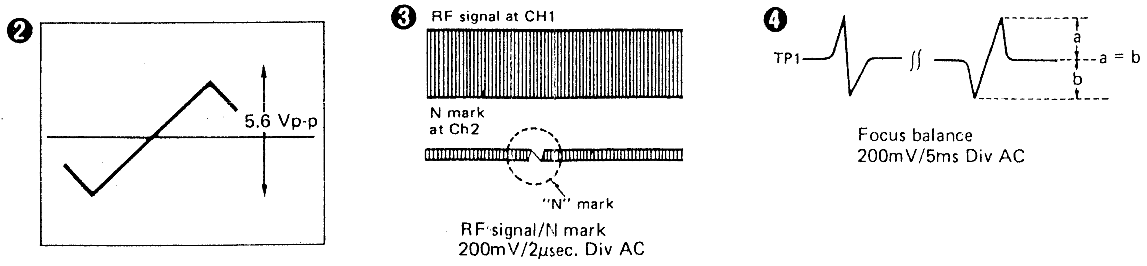
Fig: 1-2 Confirme the position of each volume

Waveform

❶



RF signal
500mV/0.5μsec. Div AC


❷
5.6 Vp-p
❸
RF signal at CH1
N mark at Ch2
"N" mark
❹
TP1
a
a = b
b

RF signal/N mark
200mV/2μsec. Div AC

Focus balance
200mV/5ms Div AC

Fig: 1-3 Confirme the each waveform

2. How to replace the optical pick-up of the traverse deck

2-1. Replacement procedure

NOTE: Follow adjustment manual instruction on SL-P7 Vol. 3 for connectors orientation.

1. Disconnects CN101, 102, 103, 104, 105, 106, 109 and CN552.
2. Remove the traverse deck from the disc holder.
3. Remove the 03 P.C.B. from the traverse deck.
4. Mount the traverse deck on the traverse unit base (SZZP1016F), and make sure the mounting screw is tightened.
5. Remove the disc clamper magnet from the disc holder.
6. Remount the disc holder in its original location and reconnect CN102, 103, and CN104.
7. Position the assembly as shown in figure 2-1.
8. Reconnect CN101, 105, 106, 109, 552 and GND in its original location.

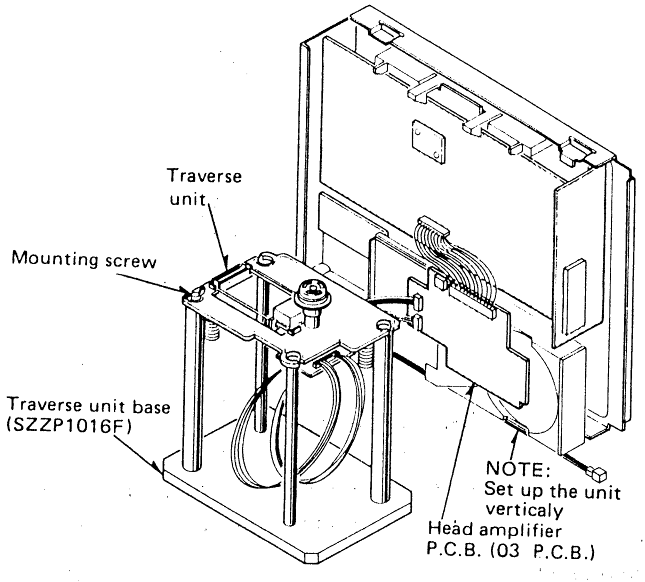

Traverse unit
Mounting screw
Traverse unit base (SZZP1016F)
NOTE: Set up the unit verticaly
Head amplifier P.C.B. (03 P.C.B.)

Fig: 2-1. Positioning view of the traverse deck and unit.

9. Remove the optical bracket and screw from the optical pick-up body as shown in figure 2-2.

NOTE: A) Be careful when removing the screw, the spring can snap out very fast and be lost.
B) Also note the position of the spring so that when ready to re-assembly it, you will remember its position.

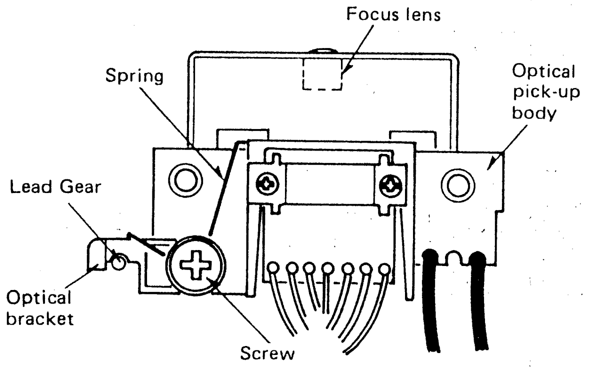

Focus lens
Spring
Optical pick-up body
Lead Gear
Optical bracket
Screw

Fig: 2-2. Rear view of optical pick-up body

10. Remove the shaft clamp mounting screw as shown in figure 2-3.
11. Remove the two suspension shafts by lifting and pulling to the left. Optical pick-up body can be separated from the deck as shown in figure 2-3.

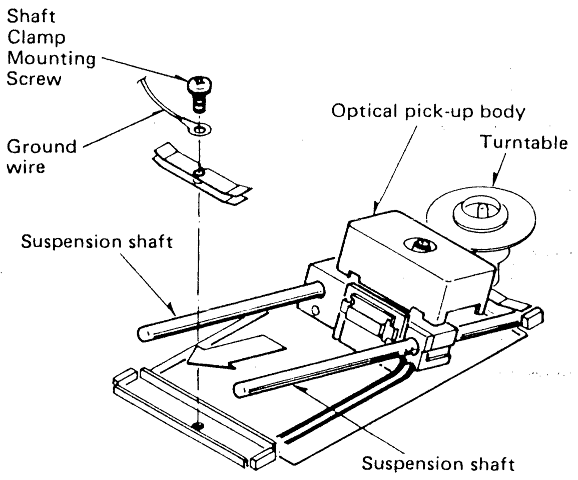

Shaft Clamp Mounting Screw
Ground wire
Optical pick-up body
Turntable
Suspension shaft
Suspension shaft

Fig: 2-3. Top view of traverse deck

12. Before proceeding to replace the optical pick-up, observe the following precautions:

A) The laser diode can be destroyed if P305 remains open too long (about 20 seconds).
Do not remove the shorting pin from P305 until you are ready to connect it to 03 P.C.B. CN305 as shown in figure 2-4.

B) Be certain that rest detection switch (S101) and end detection switch (S102 have not been bent. If they have, traverse motor will remain on.

13. Reassemble the optical pick-up to the traverse deck by following step 12 through 1 in reverse procedurs.

NOTE: Be sure to reconnect the ground wire.

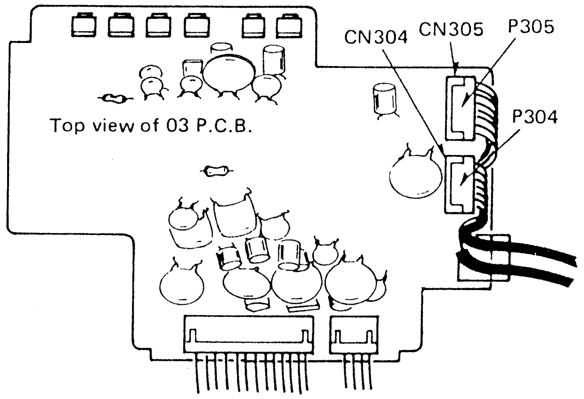

CN304
CN305
P305
P304
Top view of 03 P.C.B.

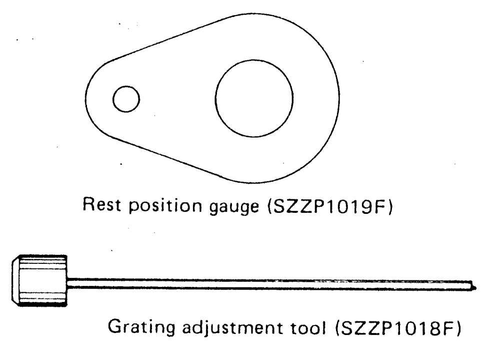
Fig: 2-4. Top view of 03 P.C.B.

3. Testers and gauge kits for adjustment.

1. Two-channel oscilloscope (with trigger) of 30 MHz or over.
2. Ordinary disc and Test Disc (SZZP1014F).
3. Hexagonal wrench (1.75mm and 2.0mm).
4. Gauge ket (SZZP1022F).

Caution

It is very dangerous to lock at or touch the laser radiation. (Laser radiation is invisible).
With the unit turned "on", laser radiation is emitted from the pick-up lens. Be careful during adjustment in particular.


Rest position gauge (SZZP1019F)
Grating adjustment tool (SZZP1018F)

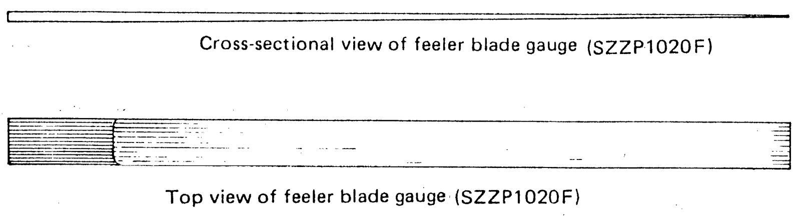

Cross-sectional view of feeler blade gauge (SZZP1020F)
Top view of feeler blade gauge (SZZP1020F)

Fig: 3-1. Gauge kits (SZZP1022F)

Vol. 4

4. How to aligh the optical pick-up of the traverse deck

4-1. Adjustment procedure

Caution:

1) Do not look into the lens when power is applied to the unit, since there is laser radiation (H.H.S./D.H.W./etc., regulation).
2) These steps must be followed in order.

A. Rest position adjustment (optical pick-up)

1. Assure that leaf switches S101 (rest switch) and S102 (end switch) have not been mashed during reassembly and therefore set to "ON".
   If they are, carefully separate the contacts about 2mm.
2. Apply power to the unit. This will cause the traverse motor to wind the optical pick-up to the rest position.
3. Turn the power switch "OFF".
4. Place the REST POSITION GAUGE (SZZP1019F) on the turntable as shown in figure 4-1.
5. Assure that the lens is concentric within the hole of the REST POSITION GAUGE (SZZP1091F) as shown in figure 4-2.

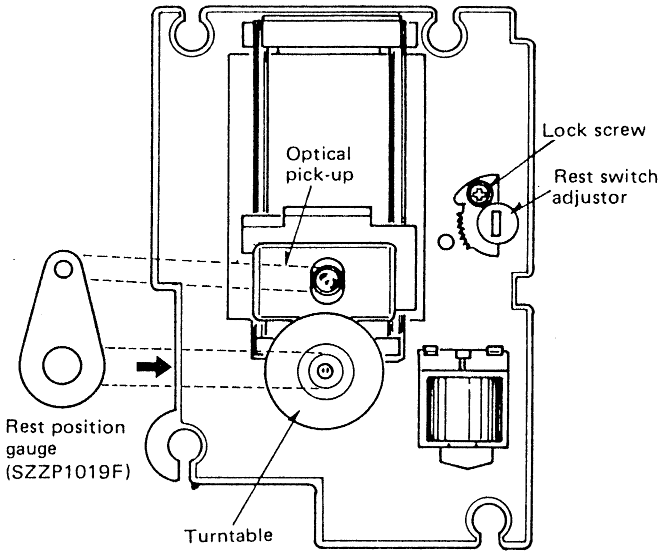

Lock screw
Optical pick-up
Rest switch adjustor
Rest position gauge (SZZP1019F)
Turntable

Fig: 4-1. Top view of traverse deck

- **Optical pick-up is too close to the turntable.**

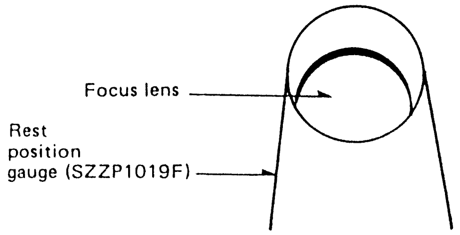

Focus lens
Rest position gauge (SZZP1019F)

Fig: 4-2. "NG" (Too close)

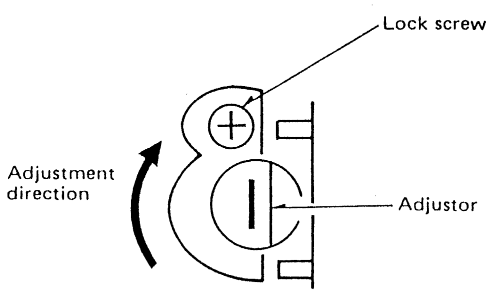

Lock screw
Adjustment direction
Adjustor

Fig: 4-3. Adjustment direction

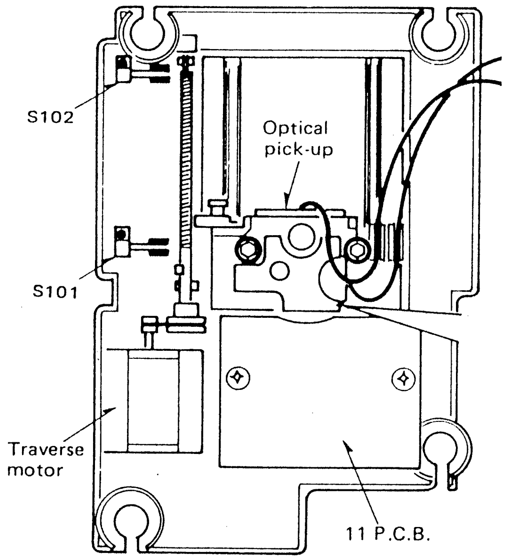

S102
Optical pick-up
S101
Traverse motor
11 P.C.B.

Fig: 4-4. Bottom view of traverse unit

TO ADJUST:

1) Loosen the lock screw and turn REST switch adjustor in the detection as shuwn figure 4-3.
2. Note that if the REST detection switch (S101) is too much toward S102, then the pick-up will REST too far away from the turntable at REST position. If so apply power and repeat step 1 above until REST detection is detected when the lens is concentric with the hole of the REST POSITION GAUGE.

- **No adjustment required.**

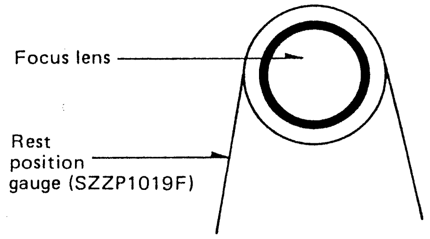

Focus lens
Rest position gauge (SZZP1019F)

Fig: 4-5. "OK"

- **Optical pick-up is too far from the turntable.**

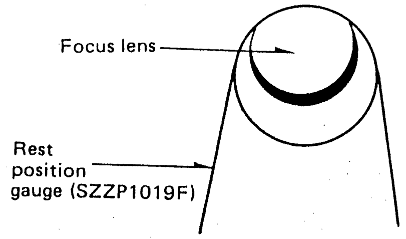

Focus lens
Rest position gauge (SZZP1019F)

Fig: 4-6. "NG" (Too far)

TO ADJUST:

Loosen the lock screw and turn the REST switch adjustor in the direction as shown in figure 4-7.

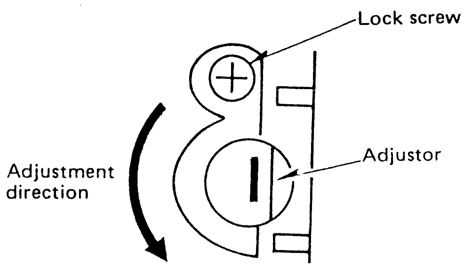

Lock screw
Adjustor
Adjustment direction

Fig: 4-7. Adjustment direction

To verify correct adjustment, place the disc on the turntable and apply power to the unit. This will auto cycle the optical pick-up. Re-check alignment with the REST POSITION GAUGE (SZZP1019F) as shown in figure 4-5.

B. Turntable height adjustment

NOTE: Necessary after Direct Drive spindle motor is replaced or RF signal is not obtained.

1. Disable focus search by opening R122 (180k) on 03 P.C.B. as shown in figure 4-8.

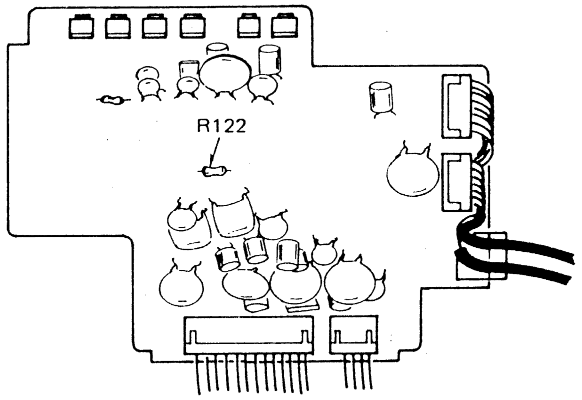


Fig: 4-8. Top view of 03 P.C.B. (Head Amp.)

2. Insert the thin end of FEELER BLADE GAUGE (SZZP1020F) between the turntable and the shaft bearing as shown in figure 4-9.

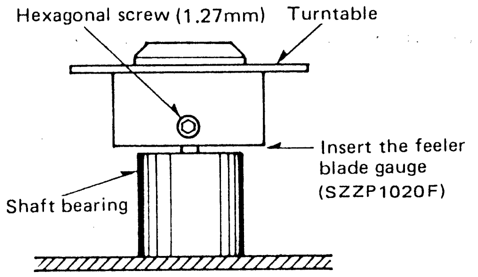


Fig: 4-9. Front view of traverse deck

3. Slide the FEELER BLADE GAUGE (SZZP1020F) toward the thick end and mark the gauge with a pencil, where it and the turntable touch and until the blade can not be fed anymore then remove the gauge.
4. Connect the oscilloscope to TP107 of SL-P7 or CN109 pin ③/ RF test pin of SL-P8.
5. Place a disc on the turntable and clamp it with the magnet.
6. Apply power to the unit.
7. Press eject "OUT" and eject "IN".
8. Confirm if RF signal is present as shown in figure 4-10. If not, proceed to the next step.

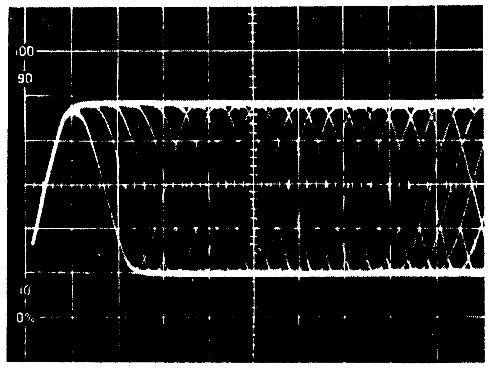


Fig: 4-10. RF signal

9. To confirm:
   Gently tap the disc at point "A". If RF signal appears, the turntable is too low. If RF shignal does not appear, tap the disc at point "B". RF signal should appear indicating that the turntable is too high.

10. To adjust:
    1) Insert the FEELER BLADE GAUGE between the turntable and the shaft bearing to the previously marked point.
    2) Loosen the hex 1.75mm turntable set screw.
    3) If the turntable is too low, slide FEELER BLADE GAUGE about 4mm towards the thick end and Remove the FEELER BLADE GAUGE.
    Reapply power and check for RF signal. (This is a "trial and error" adjustment, several attempts may be required to obtain RF signal).
    4) If the turntable is too high, insert the FEELER BLADE GAUGE and move about 4mm towards the thin end, using the same method as in step 3.
    5) Reconnect R122 to enable focus search.

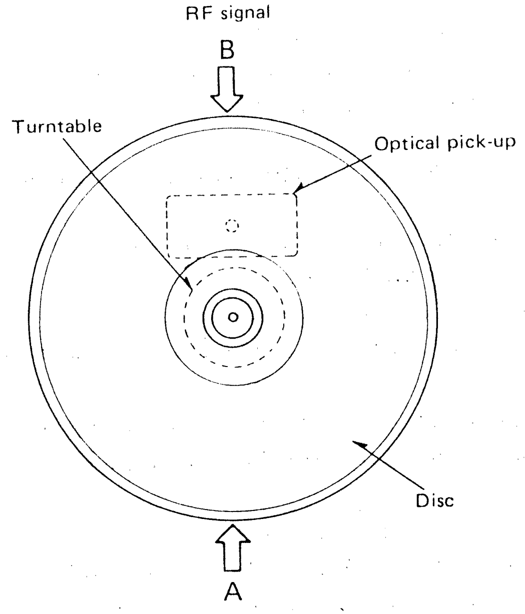


Fig: 4-11. Top view of disc set up

C. Mechanical adjustment

1. Place the TEST DISC (SZZP1014F) on the turntable with clamper magnet.
2. Connect the oscilloscope to TP107 of SL-P7 or CN109 pin ③/ RF test pin of SL-P8.
3. Apply power to the unit and select the play mode.
4. Confirm that the RF signal is as shown in Figure 4-12. If it is not present, proceed to next step. If RF signal is as shown, skip step 5.

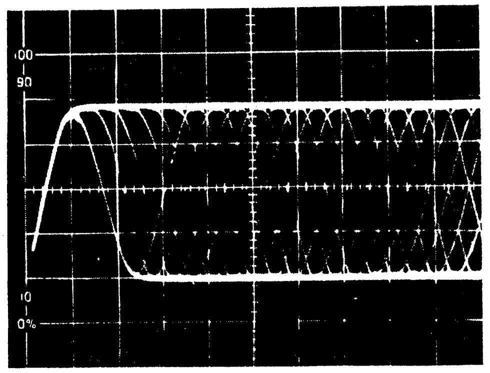


Fig: 4-12. RF Signal

5. To adjust hex 2.0mm screw to the right or left to obtain the RF signal (Visual check) as shown in figure 4-13.

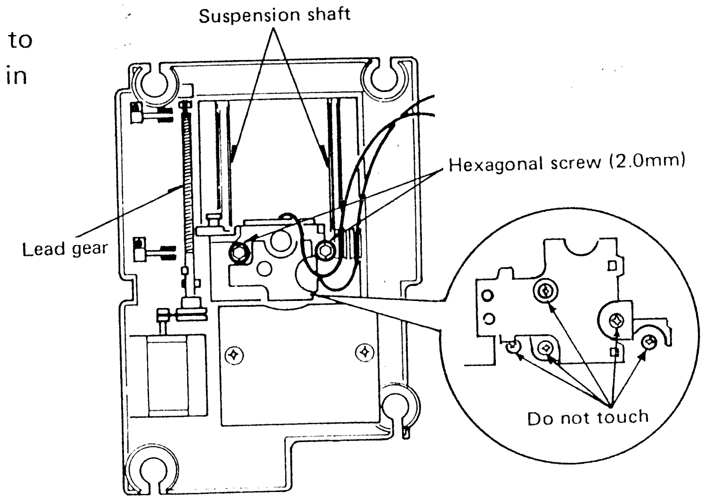


Fig: 4-13. Bottom view of traverse unit

D. Grating adjustment

1. Place the TEST DISC (SZZP1014F) on the turntable and clamp it with the magnet.
2. Connect the oscilloscope as follows.

   ** Sweep speed . .200mV/2μsec. DIV AC.
   SH-1 . . . . .TP107 of SL-P7 or CN109 pin ③/RF test pin of SL-P8.
   CH-2 . . . . .R131 end of C123 on 03 P.C.B.
3. Apply power to the unit and select play mode.
4. If RF signal and "N" mark are present no adjustment is required as shown in figure 4-14. If RF signal and "N" mark are not present, perform step 5.

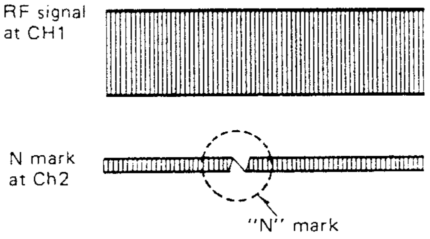
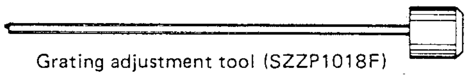

RF signal at CH1
N mark at Ch2
"N" mark

Fig: 4-14. RF signal and N mark

5. Insert the GRATING ADJUSTMENT TOOL (SZZP1018F) into the hole on the left side of the optical pick-up body as shown in figure 4-15.


Grating adjustment tool (SZZP1018F)

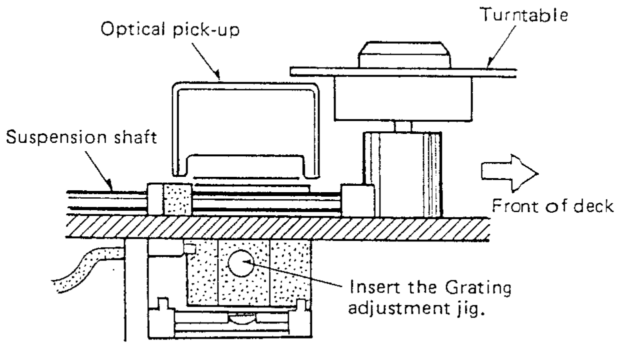

Optical pick-up
Turntable
Suspension shaft
Front of deck
Insert the Grating adjustment jig.

Fig: 4-15. Left side view of traverse unit

6. Rotate the GRATING ADJUSTMENT TOOL (SZZP1018F) toward right or left until the "N" mark is sharpest and maximum RF signal is obtained as shown in figure 4-16.

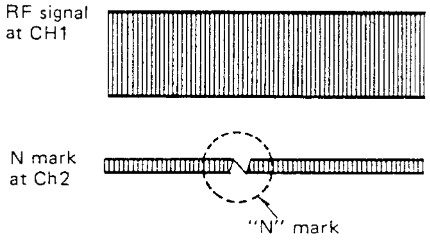

RF signal at CH1
N mark at Ch2
"N" mark

Fig: 4-16. RF signal and N mark

5. Electrical alignment of main unit (Vol. 3)

Electrical alignment of main unit follow the adjustment manual Vol. 3 step by step.

6. Others

After adjustment dress all components to lay flat on 03 P.C.B. as shown in figure 6-1, and reassembly on the traverse deck.

ONCE THE P.C.B. IS MOUNTED, ASSURE THAT THE BOTTOM OF THE PICK-UP DOSE NOT INTERFERE WITH ANY OF THE COMPONENTS THEREFORE MAKE SURE THAT THE TRACKS IN THE OUTER PREIFERY OF THE DISC ARE ACCESSABLE.

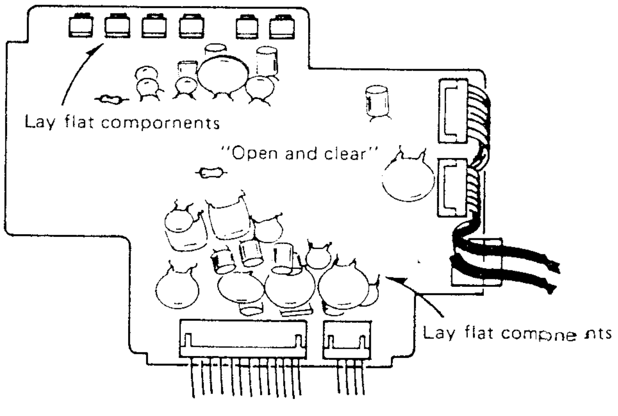

Lay flat compornents
"Open and clear"
Lay flat components

Fig: 6-1. Top view of 03 P.C.B. (Head Amp)